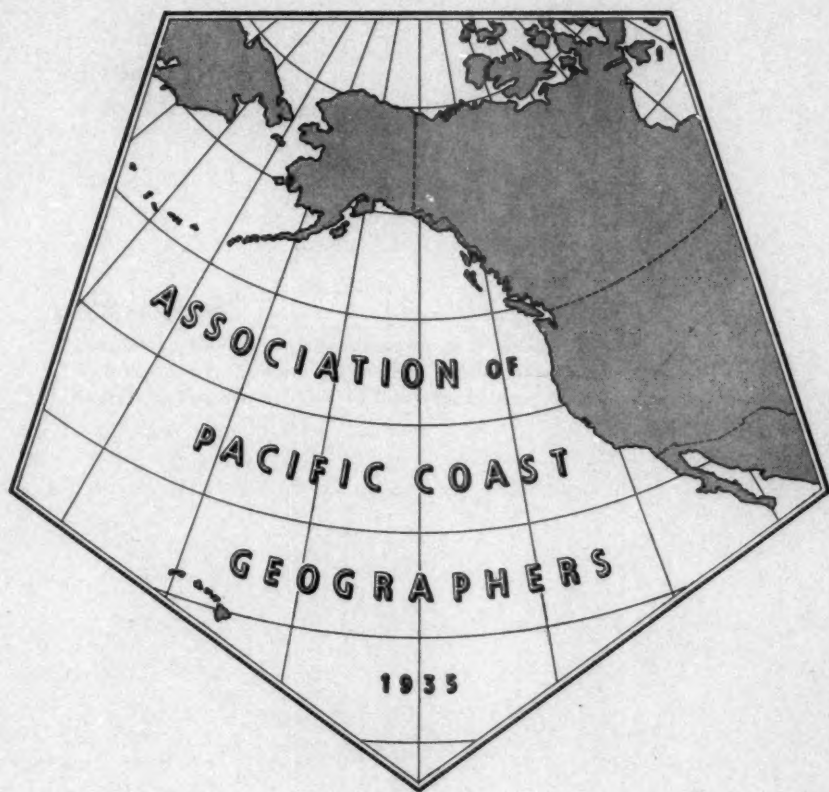


# YEARBOOK

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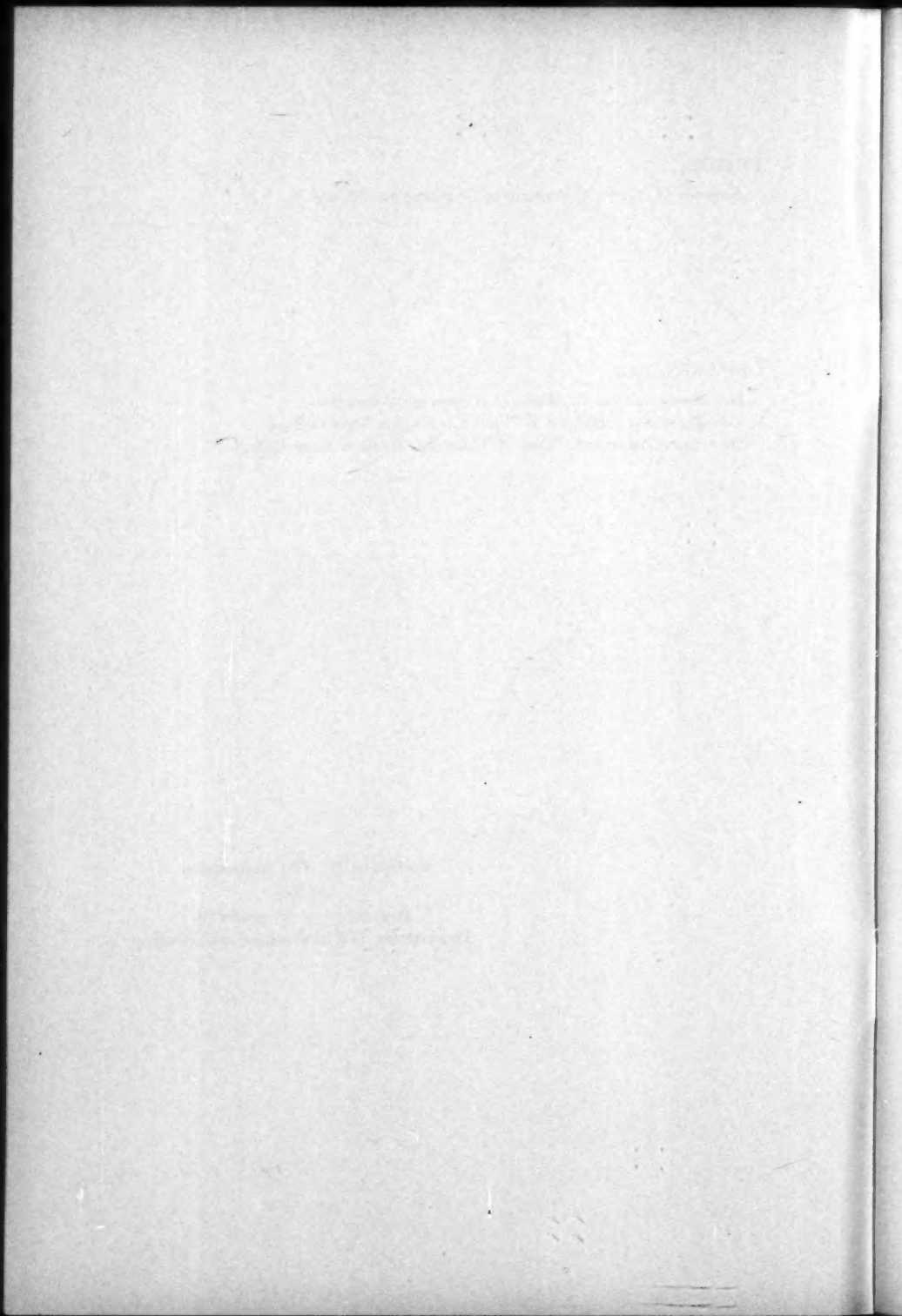


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10-15-1915

Received of the Treasurer of the  
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the sum of \$100.00  
for the year 1915

in full for the year 1915

for the year 1915

for the year 1915

for the year 1915

## WHEN CAN CALIFORNIA JOIN THE UNION? \*

MARION E. MARTS  
*University of Washington, Seattle*

Americans take pride in having one of the most socially and technically mobile societies in the world. We admire the long haul and the bulk cargo handler, the interstate expressway and centralized train control. We take pride in Big and Little Inches and other long distance pipelines, and in supertankers. Everywhere about us we note with approval the physical evidence of the linkage of major markets and distant sources of supply. We do not argue the establishment of a Common Market or an Inner Thirteen or Outer Seven or Thirty-Seven. We long ago chose the Common Market and wrote it into our Constitution, thereby choosing in favor of economies of area specialization and of large-scale production and consumption. Occasionally we may urge ourselves to Buy American, but never to Buy Nevadan. We consider it perfectly normal to be awakened by a Connecticut alarm clock; to eat a breakfast gathered from Florida, Iowa, and Kansas; and so forth.

In the face of this geographic and economic sophistication, it is indeed curious that in dealing with water and hydropower resources, we revert to a medieval sectionalism of amazing tenacity. Rather than link supply with existing markets in the conventional economically rational manner, we expect new markets to arise close to the supply, and indeed develop our physical potentials only as we forecast a demand within the confines of our medieval duchy.

No example of this sectionalism is more outlandish than the state of Maine's prohibition on exporting Maine hydropower outside the state. But we need not go to the far corner of the United States for outlandish examples of resource sectionalism. Nowhere is it more extreme than here in the Far West, where *not* cost but legal sanctions and anthropological rituals combine to keep water and hydropower from the places that need them. The last assistant secretary of the Department of the Interior to suggest that water go to California instead of the ocean was sent to Afghanistan to do penance. Lately he has been allowed to return, but only to California. The United States Supreme Court's Special Master of the Colorado River has been engaged for some years now in what seems to many people to be an effort to distribute a water shortage in the most economically inefficient way that is legally permissible. In recent years we have been treated to the spectacle of our usually sensible Canadian cousins seeking not just to ignore North America's greatest hydro-power stream, the Columbia, but actually to make the great river less great by turning it into the Fraser. In their favor we must admit they didn't try to argue that the proposal was sensible; they merely contended it was legal because the word "parties"

\* Presidential address at the annual banquet of the Association of Pacific Coast Geographers (San Francisco, April 7, 1961).

was capitalized in a misguided artifact known as the Boundary Waters Treaty of 1909. This treaty was designed to protect the sectional interest against the Common Good, and its use against us by Canada was a well-deserved case of an errant chicken coming home to roost. For the Harmon Doctrine was a United States-inspired concept written into the Treaty to guarantee that the upstream state could have its own way. Apparently the then Secretary of State's knowledge of geography was such that he must have thought the United States was always the upstream state!

More recently, in May of 1959, we have observed the amazing request of the Senate Committee on Interior and Insular Affairs that the Bonneville Power Administration find out how much "surplus secondary" Pacific Northwest energy could be marketed economically in California. Not how much good solid year-around energy—ready kilowatts—could be delivered economically to California markets, but how much part-time, leftover stuff that no one else wants or will want in the future! Please, Mr. Bonneville, how many leftovers might you have for California after you have dined?

But even this limited request represented a change in the political climate. Just a few years before, a plot by federal engineers to examine a possible exchange of power between California and the Northwest was discovered and stamped out by a Congressional committee before any real harm had been done. This plot was brought to light shortly after the infamous United Western affair—note the carefully designed, innocuous-sounding title, "United Western"—in which the then Assistant Secretary of Interior William Warne actually encouraged a subversive group of federal engineers and economists to see if there might be any surplus waters in the West which could be taken to California economically. Even California objected to the idea, seeing it as an underhanded way of assisting Arizona to out-draw California on the Colorado River. Also, the then-Governor of Washington, Mr. Langlie, viewed the United Western scheme as a device to promote construction of a large Hells Canyon Dam on the Snake River. By supporting a dam with one-fourth the storage capacity, Mr. Langlie and his cohorts helped guarantee that there would be no surplus energy for California, or even for Mr. Langlie's own state of Washington—thereby wrapping the sovereign state of Idaho in the protective shroud of the Harmon Doctrine.

What is there in our socio-political ethic that sanctions the shipping of rutabagas and rotenone in interstate commerce, and even peaches and petroleum, but enforces taboos on long-haul movements of water and electricity? Why do we appraise the British Electricity Grid and the emerging European Superpower Grid as efficient, and yet limit ourselves to sectional, regional, and local horizons that give little elbow-room to our vaunted technological prowess and organizational efficiency? There is no question but that it is technically feasible to interconnect the electric power systems of California and the Pacific Northwest, and there is a real possibility that the interconnection would be economic. Certainly the prospects appear good enough to deserve careful investigation. The underlying reasons for our inconsistent behavior, of course, are the fundamental human motives of envy, fear, and avarice, and the overwhelming importance of water supplies. As geographers instead of moralists or psychologists, we are interested here in the mechanisms for implementing these fundamental human weaknesses in the field of water resource management. Examined individually,

these mechanisms look rational and equitable. In context, however, they begin to look like devices to enforce an allocation of resources and a redistribution of population that are counter to the underlying social and economic forces accounting for the human geography of the western United States.

Most powerful of these mechanisms is the concept of state's rights in the water resource field. The water in a river, and by extension the hydropower generated by that water, is the property of the individual state (and in Canada, of the province). Although the state must grant rights to the use of its waters to its citizens under reasonable conditions, it has no obligation to grant such rights to citizens of other states, and dare not allow temporary usage for fear water might not be recaptured. Thus a state boundary line becomes a strong barrier which can only be effectively breached by the force of the federal government or the interstate river compact.

The federal government, it is true, has certain superior legal rights over many rivers, based on the commerce clause of the Constitution and the government's property rights in Public Domain lands. But the assertion of such rights is limited by the political organization of the legislative branch of our government. Congress is organized by states, as every school-boy knows. Every state has an equal voice in the Senate, and the congressional districts represented in the House of Representatives never cross state boundaries regardless of any community of interests—such as, for example, exist in the New York City or Philadelphia or Portland-Vancouver metropolitan areas. The only member of Congress who is responsible to an interstate, or national, electorate is the Vice-President, who presides over the Senate and can vote in case of a tie. As our population and social fabric became more and more mobile and more and more national in outlook, the organization of our Congress will become increasingly archaic and unresponsive to supra-local interests and objectives. As Congress is now organized, a senator or representative from Idaho or Washington would risk political suicide in endorsing export of Columbia River water or hydropower to California.

The interstate compact is a device developed as an attempt to utilize rivers on a regional rather than single-state basis. But it is a weak device. Its authority is based only on unanimous consent, so that a compact agreement is reached only when there is equality of discontent distributed among all of the states involved. Again, each state normally has an equal vote (there are some exceptions) regardless of importance, involvement, or need, and the federal government's influence depends chiefly on granting or withholding "bribes" in the form of funds for constructing projects. Thus the Colorado River Compact was hammered into being by the federal power to grant or withhold construction of Hoover Dam. The Arkansas River Compact between Colorado and Kansas was encouraged by federal construction of the John Martin Reservoir, built with nonrepayable flood control appropriations, although the need for the Compact and the Reservoir was a direct result of irrigation use of the river. In the case of the Columbia River, the federal government has not had a club, or rather has chosen not to use any of its potential clubs, so more than a decade has passed without ratification of a compact.

The proposed Columbia Interstate Compact makes the state bias explicit. All projects introduced will be judged upon one criterion: their ultimate



benefit to all basin states, not to the nation or the Far West, only to the basin states. Of especial importance as a source of friction between the upstream and downstream states within the Basin is the provision (Article VI-C-3) for reserving the major share of at-site power at upstream federal reservoirs for the upstream states—even though there might be greater need for, and economy in, using the power downstream. The preferential treatment sought here by the upstream states is as great—in some ways greater—than Canada is asking in the International Treaty on the Columbia River, signed but not yet ratified.

Inextricably related to the question of state's rights is another major inhibiting mechanism, the entire body of water law as it has evolved in the western United States. Water rights stem from the rights of the states. There is a fundamental conflict between the two basic doctrines of water law: riparian and appropriation doctrine. Some western states have explicitly renounced the riparian doctrine and others tacitly ignore it. Appropriation doctrine is an assertion of local sovereignty, that is that local needs are governing and may enjoy rights in perpetuity in spite of changing conditions and downstream needs. Law is a very conservative thing, being based largely on precedent. Thus errors, inefficiency, and waste are perpetuated by the legal sanctification of past practice. A wasteful practice established in 1870 in Wyoming, say, can take precedence over a social need of the 1960's in a downstream state. Specifically, for example, a wasteful irrigation practice enjoys legal protection against an efficient power possibility, especially, if they happen to be in different states. And the poor fish, who were "first in time" and therefore should be "first in right" must be content with water rights that are junior to all other uses. There is an exception here: the fish have managed to win out over some power developments by joining in a political alliance with private power interests and budget balancers.

On the other hand, riparian doctrine, though providing a little more flexibility for downstream and future users, certainly does not lend itself to diversion of water from one basin to another, because the essence of the doctrine is that the flow characteristics of a river remain essentially unchanged.

The most inflexible features of both doctrines are wedded in the water law—of all places—of California. Being in the habit of producing the biggest and best of everything in the West, California has naturally produced the West's greatest stumbling block to efficient allocation of water; namely, the county-of-origin law. Under this legislative aberration, no place in California can have water which originates in another county until a supply has been reserved for all the present and foreseeable needs of that county. Only two things have prevented this law from strangling all of California's water development. One is the fortunate fact that California has such large counties—what chaos had they been the size of townships, or Rhode Island! The second fortunate fact is that, like Blue Laws, this law is not very often enforced. It was invoked, of course, in the recent struggle to keep the waters of California's North Coast flowing into the Pacific instead of into the Sacramento Valley. I assure you this zeal to preserve the hydrologic balance of the North Pacific evokes no enthusiasm in the rain belt of Western Washington, where we would be happy to have the Pacific somewhat dehydrated.

I need not remind you that this zeal to keep the water in the local county is not matched by equal zeal to collect repayment for the cost of project construction in the local county. When it comes to costs, the effort is to shift the burden as far away as possible, preferably to the federal treasury in Washington, D.C. In the case of navigation, flood control, and irrigation works, this effort has enjoyed great success. For example, in the Columbia Basin Project repayment arrangements, the farmers are contractually obliged to pay only about one-twelfth of the construction and interest costs of the irrigation works. The other eleven-twelfths come as a subsidy, totaling at least \$1,100,000,000, two-fifths from the sale of power and three-fifths as debt interest foregone by the federal government. The political moral is that dollars may flow in but water shall not flow out. Nothing would free up water now earmarked for irrigation like asking the local areas to pay for the irrigation.

In the field of power marketing, there are some interesting factors at work which inhibit the sale of Northwest power to California. One is the preference clause in federal power legislation which requires that publicly-owned utilities be given priority to federal power over privately-owned utilities. There are some publicly-owned utilities in California, and the private utilities in the Pacific Northwest have no desire to let these public California utilities join the Northwest power pool and enjoy priority rights to Columbia River power. The private companies have enough public power agencies in the Northwest to contend with now, without seeing the enemy reinforced. The effect of the preference clause can be illustrated quite neatly; when there is exceptionally low flow in the Columbia River, an old and obsolete steam plant in Seattle is heated up and happily turns out expensive electricity for the private-power cities of Spokane and Portland—both close to the Columbia River. At the same time, the Seattle public power customers are continuing to enjoy low-cost Columbia River power, though they may be exhorted to turn off any lights they are not using. Fortunately this disconcerting situation is not known to the general public so there has been very little commotion about it.

Another of our Northwest power mores is the postage stamp rate, whereby power is sold throughout the Bonneville Power system at the same basic rate regardless of whether the customer is near or far from a generating plant. In other words, transportation—that is transmission—costs are averaged and the nearby consumer pays as much as the consumer at the far end of the Bonneville system. This is clearly an example of the principle of discrimination against the nearby market at work, and as long as no one rocks the boat everyone is content. But what if California were brought into the system? Would the postage stamp principle be extended to California, and the people of Seattle asked to help subsidize transmission costs to San Francisco, the way the people of Portland have been subsidizing transmission to Seattle for 20 years? Of course this is probably an unfounded fear, but as everyone knows, once you begin fooling around with *principles*, anything can happen. It is safer to stay out of this uncertain area.

A third tenet of our hydropower dogma is that abundant, low-cost electricity will stimulate the rise of a great industrial empire in the Pacific Northwest. Bravely we count our industrial kilowatts and the related employment, then add Boeing employment (because Boeing uses aluminum). And presto! Our dogma is substantiated. It will be embarrassing when Boeing



is producing all-plastic space ships and we have to rewrite our hydroelectric dogma. The truth of the matter is that—Boeing excepted—the Pacific Northwest economy is based on primary and semi-processed production, and our peripheral location and limited regional market will tend to perpetuate this. The Pacific Northwest aluminum industry is declining relatively and probably absolutely, and no other significant electro-process industry except plutonium is producing for a national market.

Enough of the difficulties. What are the opportunities and the logic in the situation? Nothing I have said should be taken to mean that I seriously think Columbia River water can be delivered to California at reasonable cost now. The value per unit of weight is probably too low. But if it could be, let us not prevent it with dogma and myopia. The Colorado River is another topic; here we can only say that our efficiency criterion would dictate that the water go where it can be used most effectively.

More real for the Northwest is the question of hydroelectric energy, and specifically the so-called California Intertie. A 95-mile transmission gap is all that needs bridging—less than the gap that existed between eastern and western Washington until Grand Coulee Dam was built. The intertie may very probably be economically feasible. If it is, I for one think it should be built, the sooner the better. A large and rapidly growing market exists in California. Large hydropower potentials remain unused in the Columbia Basin, within the United States and north of the border in Canada. North of the Columbia lies the great Peace River system, with at least four million kilowatts of prime potential energy and great reserves of storable water. Present storage considered for one large reservoir on the Peace amounts to three times the physical capacity of Lake Mead, with far more streamflow available for rapid refilling after the storage content is drawn down. Already a 600-mile ultra-high capacity transmission line is projected to connect the proposed Peace River development with Vancouver. North of the Peace is the great Liard River system, and beyond that the Yukon. The Canadian prejudice against exporting hydro to the United States is crumbling under the impact of these great potentials and the growing recognition of the efficiencies to be gained from tying them to the large power market of the western United States. It is time to make our own contribution to the creative crumbling of our local and regional prejudices, and the mechanisms that enforce them, and to think in terms of one great system for the production and consumption of energy, with its limits set only by financial feasibility. The advantages of coordinated operation of such a system would produce economies of mutual benefit all the way from San Diego to Skagway. The industrial location effect of large-scale hydropower would be magnified in California because it would be superimposed on the existing advantages of large market, labor supply, diversity of resources including the hydrocarbon raw materials, and complementary production of diverse products. California is the natural market for Pacific Northwest forest and agricultural products, and summer tourist attractions. It is the geographic destiny of the Pacific Northwest to be an economic colony of California—and as the core prospers, so prospers the colony.

The choice for the West is between a provincialism in managing hydro resources with truncated economic development on the one hand, and admitting California to the union on the other, with one large integrated energy base underlying a large, viable, unified economy.

## BARGING ON THE COLUMBIA

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Columbia River barging as discussed in the following paper is limited to that part of the river between Portland, Oregon—Vancouver, Washington, and Pasco, Washington.

Transportation on the Columbia River has had a long and colorful history. Almost one hundred years ago, the Oregon Steam Navigation Company was formed and during its twenty-year life it completely monopolized navigation on the Columbia. The role played by this company's vessels, most of which were stern-wheelers, was extremely important in the pre-railroad era in the Pacific Northwest. The fact that it was able to operate at a profit as long as it did is attributable more to the lack of competing transportation, than to ease of navigation on the Columbia.

Only in its estuary portion from Cascade Rapids to the sea was the Columbia easily navigable. Above this point it flows for a considerable distance across the Columbia Plateau before cutting a gorge through the Cascade Range. Although the river drops less than a foot a mile between Pasco and the sea, much of the total drop occurred at two places—The Dalles and Cascade Rapids. Portages were required around these places. Moreover, during the winter low water period, many stretches of the river were often too shallow for any but the smallest vessels. The availability of fuel also added to the expense of operation and above The Dalles timber is scarce. One of the early uses for barges in this part of the river was transporting wood to fueling stations. Some of the boats used as much as fifty cords of wood on the trip up river.

It is therefore understandable why river transportation was badly hurt by railroad transportation after 1883. From this time until the inauguration of a river development program by the federal government in the 1930's, river transportation on the Columbia above its estuary was insignificant. The construction of Cascade Locks in 1896 and the Celilo Canal in 1915 to by-pass the Cascade Rapids and The Dalles, helped increase river traffic but did not materially weaken the near monopoly of railroad transportation.

While barging on the Columbia above the Cascade Rapids was declining, that on the estuary part of the river was developing in response to local needs. Perhaps foremost among uses for barges within this area was the hauling of pulp and paper products and lumber. It must be remembered that this part of the river is navigable by ocean-going vessels as far upstream as Portland and Vancouver and barges are mainly utilized to bring freight to and from places not accessible to deep-draft ships. Among such places are the paper factories at West Linn on the Willamette River and Camas on the Columbia.

With the development of dams on the Columbia and improved navigation made possible by the slack water created, the area served by barges has been greatly expanded. The first project completed was Bonneville Dam. This not only made available a larger lock than the old one around Cascade

Rapids but created slack water to The Dalles. It was opened for navigation in 1938. After World War II, as the first step in the implementation of a plan to make navigation possible to Lewiston, Idaho, on the Snake River, McNary Dam was constructed. Built three miles east of Umatilla, Oregon, it creates a slack water pool 61 miles in length to Pasco and Kennewick, Washington. The next one built was The Dalles Dam which not only inundates both Celilo Falls and the old Dalles-Celilo Canal, but also provides a slack water navigation pool 25 miles long to the site of the John Day Dam. Still under construction, John Day Dam will create a slack water pool 76 miles long to McNary Dam. This last unit, when completed in 1967, will eliminate the last stretch of river that is difficult to navigate. Four others on the Snake River will extend navigation to Lewiston, Idaho. With the exception of the one at Bonneville, navigation locks are or will be 86 feet wide by 675 feet in length. The locks at Bonneville are 76 by 500 feet.

Four types of products make up virtually all the tonnage moving by barge on the river. They are wheat and other grains, petroleum products, wood and paper, and cement and other construction materials.

Grain, mostly wheat, moves down river from the area east of the Cascades in Washington, Oregon, and Idaho, principally to Portland, Vancouver, and Longview, for milling or for trans-shipment on ocean going vessels. Most of the petroleum products, including gasoline and fuel oil, move up-river to areas east of the Cascades. Wood and paper products are moved below Bonneville to and from paper mills. Cement and construction materials move up-river to whichever dam or dams are under construction.

The amount of tonnage moved by barge on the river has increased with each improvement in navigation. This in part has been due to the use of larger barges and reduced towing costs, when slack water was created behind each dam. These slack water pools not only require less expenditure of energy in towing than swift water, but also eliminate navigation difficulties during the winter low-water period. In the pre-improvement period only shallow draft barges of small capacity could be used and during the winter low-water period reduced tonnage was carried. When completed the project will provide a minimum depth of 15 feet on the river.

A variety of barges are used ranging in size from the flat top type capable of holding about one thousand tons of grain in top bins or one thousand tons of petroleum in tanks, to those with approximately twice this capacity. Many of these have been constructed utilizing old World War II landing craft hulls or by combining barges. Most of the older barges draw six feet of water when fully loaded.

In response to improving navigation conditions on the river, much larger barges have been and are being built. These are all steel vessels with a series of tanks in their lower hulls for carrying gasoline and other petroleum products. The upper portion consists of bins for the carrying of grain; these bins are covered with a steel house to protect the cargo from rain and snow. The hull is designed for a maximum draft of 14 feet when fully loaded. These barges are approximately 222 feet long and 42½ feet wide. They will be able to carry 50,000 gallons or 1,700 tons of oil in their tanks, or 2,000 tons of grain in the grain house. After John Day Dam creates a navigable pool, it will be possible to operate tows of five of these barges between Portland-Vancouver and Pasco. The tow will have to be broken only at Bonneville where the locks are too small for the passage of a tow of this size.

In addition to increased size another advantage of the new barges is ease

in loading and unloading grain products. Rolling hatches on top facilitate loading. Unloading is done entirely by machine. Sumps run the full length of the barge with auger conveyors which move grain to a center unloading sump; at that point, vacuum conveyors or "suckers" remove the grain from the barge. The largest such vacuum will remove 750 tons in an hour. Unloading takes two and one-half to three hours. Most of the old barges, which hold about one thousand tons of grain, are unloaded by a more costly and time-consuming method. A vacuum conveyor with a series of individual flexible rubber pipes called snakes is used. These are put into the hold of the barge and can be moved from place to place to vacuum the grain. However, men have to be employed in the hold to move the snakes and also to do some shoveling of grain. This is an all-day operation requiring the use of nine stevedores. The self-unloaders, as they are called, are unloaded by two men operating machines, plus a foreman and relief man. Petroleum products are both loaded and unloaded by pumping. Tugboats with engines developing as much as 4,500 horsepower are used to power the barge tows.

A number of other factors have been responsible for the rapid development of Columbia River barging in the post World War II period. Some of the first commodities to be moved by barge on the Columbia were gasoline and other petroleum products. In 1939, 109,116 tons of gasoline moved through the locks at Bonneville.<sup>1</sup> With both an increase in population and an increase in the use of petroleum products, larger amounts moved from Columbia ports up river. Virtually all of this moves by barge. In 1950, 535,595 tons of gasoline moved through the locks at Bonneville.<sup>2</sup> Ships bring petroleum products to Portland-Vancouver mainly from California and most gasoline is barged from here up river as far as Pasco, Washington. The two barge lines, which handle virtually all goods moving on the upper river have bulk petroleum tanks at Dalles City, Umatilla, Pasco, and East Pasco, with storage capacity of 16 million gallons. Petroleum products also move by pipeline from Salt Lake City to Pasco. Gasoline is the most important product piped and some of it is also barged down river. Of the total amount of gasoline carried by barge about 75-80 per cent moves up river and about 20-25 per cent down river. The major movement of other petroleum products, such as fuel oils, until recently has been almost all up stream. In 1960 for the first time, stove oil was moved down river; in that year 44,000 tons went down river and 39,000 up river.<sup>3</sup> This was due to a change in the production and marketing policies of the Salt Lake City Refineries. The amount of diesel oil moving down river has also been larger in recent years. In 1959 only 996 tons went through the Bonneville Locks<sup>4</sup> but in 1960 the amount was 15,441 tons.<sup>5</sup>

<sup>1</sup> Commercial Statistics, Water-borne Commerce of the United States for the Calendar Year 1939, Annual Report of the Chief of Engineers, 1940, Part 2, War Department, Office of the Chief of Engineers, Washington D.C. 1941, p. 1343.

<sup>2</sup> Commercial Statistics, Water-borne Commerce of the United States for the Calendar Year 1950, Annual Report of the Chief of Engineers, 1951, Part 2, Department of the Army, Office of the Chief of Engineers, Washington D.C. 1952, p. 1449.

<sup>3</sup> Source—U.S. Army Engineer District, Portland, Oregon.

<sup>4</sup> *Waterborne Commerce of the United States, Calendar Year 1959*, Part 4, Water-ways and Harbors: Pacific Coast, Alaska and Hawaii, Department, Corps of Engineers, p. 79.

<sup>5</sup> Source—U.S. Army Engineer District, Portland, Oregon.



A really spectacular increase has occurred in the movement of wheat by barge on the Columbia River. This is part of a general over-all increase in the amount of wheat moved to Pacific Northwest ports. High rail-freight rates to the east have, in part, been responsible for shipping more wheat to the west. Also since Public Law 480, the Agricultural Trade Development and Assistance Act, was passed<sup>6</sup> in 1954 there has been a large increase in amount of wheat shipped for export. This act, as amended, now included four divisions or titles: Title 1 authorizes the sales of surplus agricultural commodities into export for the local currency of the purchasing country; Title 2 provides for famine relief and other assistance; Title 3 is known principally as the section authorizing barter authority (surplus agricultural commodities may be bartered for strategic materials). This part was also amended to provide for the distribution of surplus agricultural commodities to needy persons in the United States, through a food stamp system. Title 4 of the Act provides for long-term supply contracts with friendly nations for annual delivery of certain quantities of surplus agricultural commodities for periods not to exceed ten years. Largely as a result of this act, United States wheat exports during the period from July 1, 1954, through March 31, 1959, were over two billion bushels.<sup>7</sup> Approximately 20 per cent of this total was shipped from the Columbia River ports and of this amount 15-20 per cent moved to the export area by barge. In round numbers the amount of wheat moving through the locks at Bonneville increased from 6 million bushels in 1954 to 33 million bushels in 1960.<sup>8</sup>

The barge is but one of three means of transport used to bring wheat down the Columbia River for export but railroads and trucks also take advantage of the low gradient Columbia Valley to cross the Cascade Mountains. In the post World War II period the barge companies have increased their percentage share of the total amount hauled. In 1955, out of a total of 3,015,184 tons received at Columbia River ports, the railroads moved 86 per cent, barges transported 9 per cent, and the remainder was hauled by truck.<sup>9</sup> In 1959 out of a total of 3,849,486 tons the percentages were: railroads, 72 per cent; barges, 19 per cent; and trucks, 9 per cent.<sup>10</sup>

Intense competition between the carriers has developed in recent years. Two successive rate cuts, averaging 25 per cent each, by the railroads on May 12, 1958, and September 30, 1960, have driven freight rates for wheat down to the lowest level in years. Barge lines accuse the railroad companies of trying to force them out of business before the John Day Dam is completed in 1967. From a competitive standpoint, the railroad companies certainly have cause for concern. When the stretch of river behind John Day Dam has been changed to slack water, five barge tows with each barge carrying 2000 tons of grain will be possible. Such a tow can carry as much grain as 180 fully loaded box cars.

<sup>6</sup> *U.S. Statutes at Large*, 83rd Congress, 2nd Session, 1954, Vol. 68, Part I, pp. 454-459.

<sup>7</sup> Western Wheat Associates, Portland, Oregon.

<sup>8</sup> *Waterborne Commerce of the United States*, Calendar Year 1954, Part 4, Waterways and Harbors, Pacific Coast, Alaska and Pacific Islands, Department of the Army, Corps of Engineers p. 47, and U. S. Army Engineer District, Portland, Oregon.

<sup>9</sup> U.S. Department of Agriculture, A.M.S. Grain Division, Market News Branch, Portland 5, Oregon.

<sup>10</sup> *Ibid.*

The railroad companies justify their rate decreases by pointing out that the larger part of freight hauled from the Northwest Coast area is lumber. A large number of boxcars are sent to the Northwest to pick up this lumber. Because of the fact that the relatively small population of the Northwest does not constitute a large market for goods from other areas, many of the boxcars are shipped in empty. As the main rail lines pass through the wheat producing areas they might as well load the cars with wheat destined for west coast ports as to carry them empty.

The barge companies enjoy a number of advantages not shared by the railroads. They are: Maintenance of waterway and toll-free locks provided by the federal government, and rapid turn around time. Barges have the advantage of unloading wheat near areas where they load petroleum products. On the other hand lumber is the main product hauled east by the railroads. Wheat can be unloaded rapidly from boxcars but it takes considerable time to load cars and assemble a lumber train. Moreover, boxcars of lumber often must be loaded and brought from a number of places.

The Columbia River Valley provides a great natural gateway through the Cascade Range. Its importance as a low gradient east-west land routeway is indicated by the presence of highways and railroads on both sides of the river. With the development of an improved waterway, barging has joined railroading and trucking in the movement of freight. The competitive position of the barge seems assured. The potential of water transport, latent for so long because of navigation difficulties, may be achieved. It is certain that as more and more large barges move further and further on the river unit costs per mile decrease. Optimism in the future of barging must, however, be tempered by the realization that one or a multitude of factors could inhibit its anticipated growth. Some of them (not necessarily in their order of importance) are:

1. Change in government policy regarding the export of wheat.
2. Loss of foreign wheat markets to competitors.
3. Imposition of lock tolls and various taxes as advocated by the railroads.
4. Extension of petroleum pipeline network eliminating some of the present markets for petroleum.

Perhaps the greatest weakness of Columbia River barging is the lack of diversity of products hauled. Unfortunately little change is anticipated in the foreseeable future.

# THE ISLE OF MAN

## *Geographical Factors in the Evolution of a Political Enclave*

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Written in the eighteenth century, Boswell's Life of Johnson contains this passage:

I mentioned a scheme which I had of making a tour to the Isle of Man, and giving a full account of it; and that Mr. Burke had playfully suggested as a motto, 'the proper study of Mankind is Man'.

There is some foundation for Mr. Burke's thought: on this unique isle, located at the hub of the wheel of the British Isles, yet not strictly a part of





## Physical Features

The Isle of Man's central location in the Irish Sea and the poverty of its natural resources have been the major geographical influences in shaping the destiny of the Manx people. Except for the flat northern portion, Man is a small upland, deeply dissected by streams and worn on the coasts to wave-cut ragged cliffs. Cutting transversely across the central highlands is the deeply incised Greeba Valley. Southwards from Snaefell flows the river Glass, which before reaching the sea is joined by the Dhoo: the Dhoo and the Glass give their joint name to Douglas, the capital on the east coast. Of

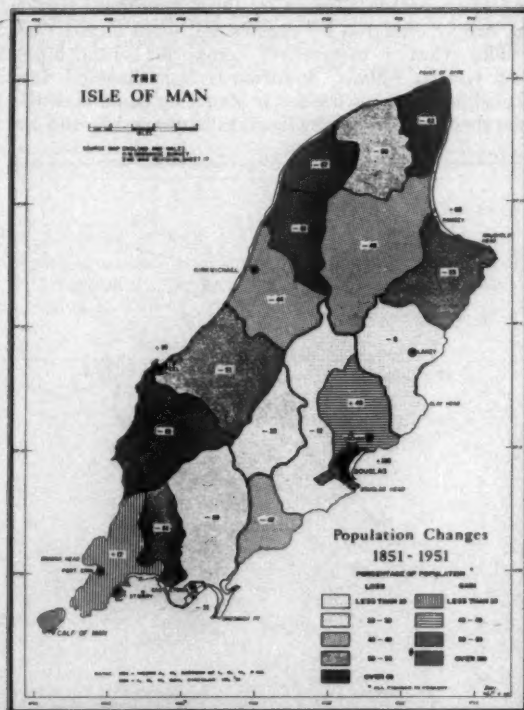


the 50,000 inhabitants of Man, Douglas boasts almost one half, Castletown, Peel and Ramsey, on the south, west, and north coasts, respectively, muster another quarter, and the remainder is a scattered rural population of about thirty persons per square mile.

### Political History

The Insular Government is autonomous in domestic affairs; acknowledges the Queen of England as titular head through the resident Lieutenant-Governor; and Parliamentary Acts do not apply to the Isle of Man unless specifically mentioned and then only subject to acceptance by the Tynwald Court which is the collective name for the bicameral legislature consisting of the Legislative Council and the House of Keys.

In the ninth century, the Keys were the elected representatives from the islands of the Norse Kingdom of the Isles. Eight Keys came from the arcuate



group of islands off the western Scottish coast and 16 were elected from Man, which was the seat of the government.

The Norse divided the island into sheadings, each of which was obliged to provide and equip a Viking longship, and these divisions, with their subdivisions, treens and quarterlands, are in existence today. All 24 Keys, however, are now elected from the Isle of Man.

The island's proximity to its neighboring islands of Ireland and Britain, and its isolation by virtue of its insularity, made it a refuge for migrant peoples from the earliest times. Neolithic relicts abound, and Goidels from Ireland and Druids from Anglesey preceded the Norse, whose 300-year occupation had a tremendous cultural impact.

Rounding Cape Wrath, the fjord coast of Scotland beckoned the Vikings southward to penetrate the Irish Sea where, directly in their course, the Isle of Man offered perfect beaching facilities in the Curragh Lake zone. Here were lakes of glacial meltwater origin: their shallowness presented no problem to the flat-bottomed vessels: the gently shelving lake shore permitted easy beaching for loading, disembarking, and repairs: the reedy vegetation, some shelter and concealment, and the slopes of Snaefell offered timber for shipwrights. As a pirate base for forays to the nearby coasts, the central location and the admirable site were unexcelled. The first group of Norsemen was purely militant in character, but the second, numbering women amongst its members, came to plough and not to plunder, and established government based on the division of the island into sheadings.

Each sheading was a carefully considered area and each reached inland to the height of land so that within a sheading would be a stretch of coast for ship launching and fishing, a lowland for agriculture, a foothill area for providing pasture for cattle and sheep as well as access to bracken-covered moor for fuel, and to wooded upland and glen for timber for ship building.

### Economic Resources

Except for recent efforts at re-forestry there are few wooded areas on the island today, and it would be reasonable to assume that the destruction of the Manx post-glacial forests must be attributed to the Norse during their 300 years on Man. It may be, too, more than a coincidence, that the decline of the Norse power in the Irish Sea occurred at a time when the forest resource in the Isle of Man was suffering extensive depletion.

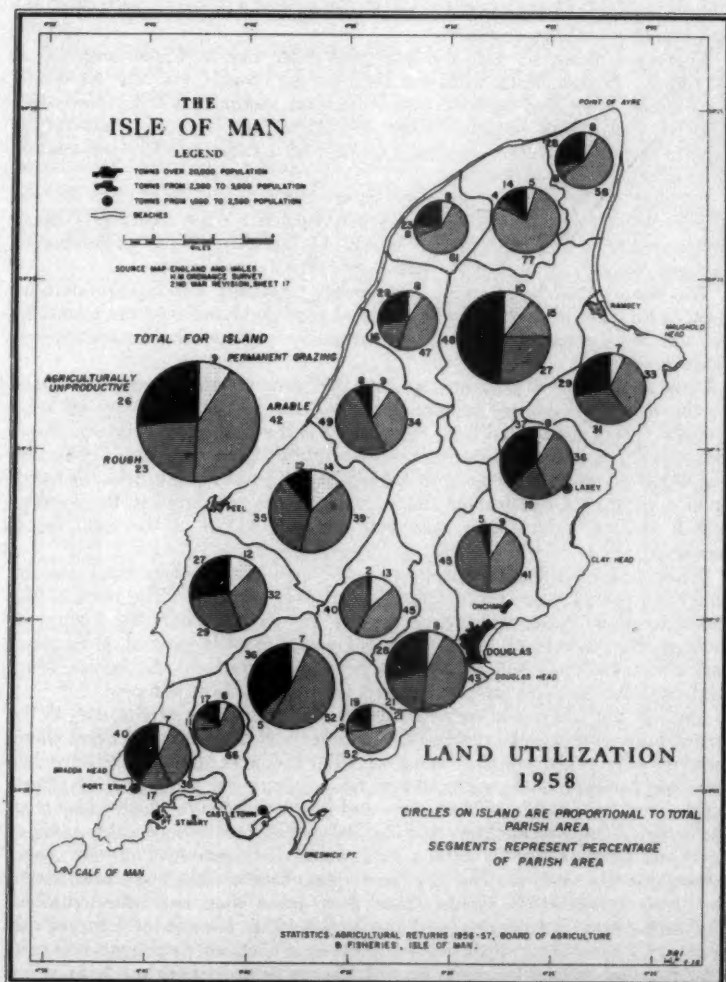
After the Norse had left, the location within four hours' sailing of four richer, more powerful neighbors led to Man's being a pawn in the game of war, and for three centuries the island's sovereignty constantly changed hands, to the detriment of the social condition of the Manx people. The poverty and paucity of arable land in Man turned the efforts of the Manx to wresting a living from the sea. In the fifteenth and sixteenth centuries, herring fishing was a seasonal adjunct to the raising of cattle and sheep that thrived but poorly on the heath and moorland that covers half the island.

The outstanding feature of all Manx livestock was their hardiness and smallness. The old breed of cattle was akin to that of Galloway, but was always small and poor. The horse looked very much like an untended Shetland pony, and as part of his endeavor to improve insular livestock, the seventh Earl of Derby, during the eighteenth century, instituted "Lord Derby's Race" to be held at Derbyhaven, near Castletown, for competing island ponies. This event was the original forerunner of the world-famous Derby.

On the highlands, the Loghtan sheep, probably a Scandinavian importation, have survived in numbers, and there is a tendency in both ewes and rams to boast four or six horns.

The difference in tariff rates between the Isle of Man and England and Scotland, tempted the fishermen to a more lucrative, but illegal, traffic in

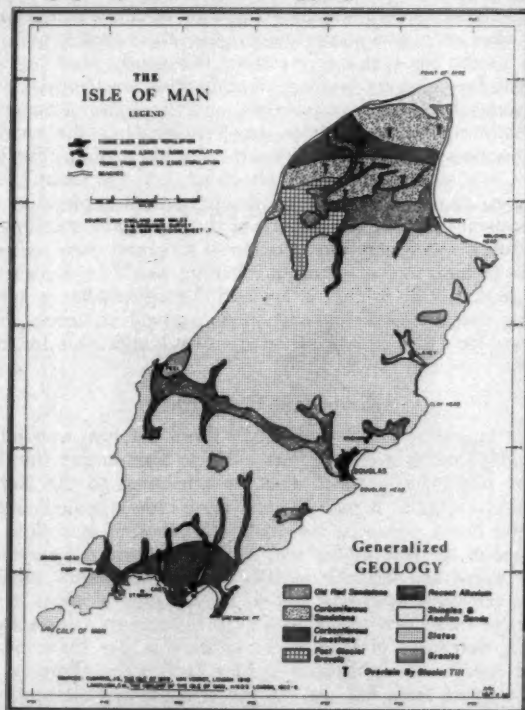






contraband goods. During the seventeenth and eighteenth centuries, the island became the most notorious smugglers' nest in the British Isles. From France, Spain, and the East Indies came wines, spirits, silks, teas, and tobaccos, which, deposited in Man, made it a vast storehouse for wares which were smuggled to nearby shores.

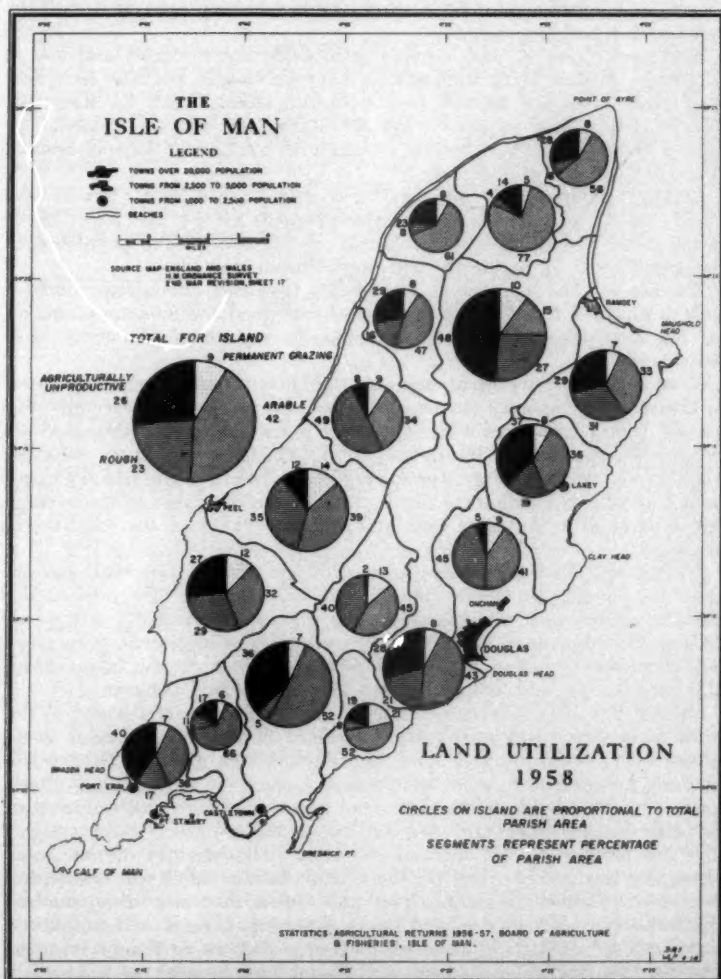
The "trade" died a natural death when tariff parity was established, but through Viking piracy and Manx smuggling, the maritime heritage has



made Manxmen intrepid sailors, and at least three members of the *Bounty*, Captain William Bligh, John Adams, and Christian Fletcher, were Manxmen.

Today the Manx fishing fleet is practically non-existent; two years ago there were fewer than one hundred boats fishing in Manx waters, and of these only five were commissioned in the Isle of Man.

The resources of the land are few. During the nineteenth century, lead, copper, silver, zinc, and iron were profitably extracted. In 1854 the lead mine at Laxey attained the greatest lead tonnage output of any mine in the British Isles. The mines' reaching uneconomic depths, the occupational hazards of operating technologically unadvanced mines, the transportation costs to the nearest smelting works in Britain, and the opening of mines elsewhere in the world, hastened the Manx mining industry's demise. About the turn of the century, Manx miners emigrated to the gold fields of South Africa and Australia, and the coal mines of the United States, where in





Cleveland there are today more folk of Manx descent than there are inhabitants on the Isle of Man.

The only industries that are flourishing are based on the ancient crafts of brewing and weaving. The quayside brewery at Castletown imports barley and hops from England, and using pure limestone water, manufactures an ale which even finds its way to restaurant tables in Southern California. Hidden in the Curragh marsh are residual pockets of *Phormium Tenax*, once cultivated for the canvas and rope-making associated with the defunct ship-building industry.

There are, however, two thriving wool mills, one at Laxey and one at St. John's. At first, Manx wool was used for the tweeds, but now New Zealand lambs' wool and Scottish and Australian merino wools are imported. The St. John's mill employs about 80 Manx folk, and the value of its exports to the U.S.A. has reached a quarter of a million dollars *per annum*, although this figure is declining.

Lacking manufacturing industry in a major sense, one turns to the island's fields and farms to find economic support for the islanders. One is disappointed in this expectancy: barely 14 per cent of the population is engaged directly or indirectly with agricultural production.

The Isle of Man possesses no first quality farmland, although proportionately to England and Wales, it is endowed with good and medium farmland, but has more than its share of agriculturally unproductive mountain and urban land.

Grass is the most important crop, and the Manx farming economy is based on the use of temporary pastures provided for two out of every six crop rotation years. Associated with the pasture is the rearing of livestock which today is the backbone of the farming, and with it the cultivation of fodder crops, clover, kale, cabbage, turnip, rape, and swedes. The island's major grain crop of oats yields some thirty cwt per acre compared to the average British yield of twenty-four cwt, and occupies 11/14 of the total cereal acreage.

Whereas England and Wales have 28.7 per cent of their total acreage under the plough, the Isle of Man has but 18.9 per cent. The need of the island to graze cattle on rotation leys is the most outstanding feature of the agricultural picture: of the acreage given to grass in general, in England and Wales 68.5 per cent is given to permanent grass; in the Isle of Man, land used for hay and temporary grass amounts to 74.4 per cent.

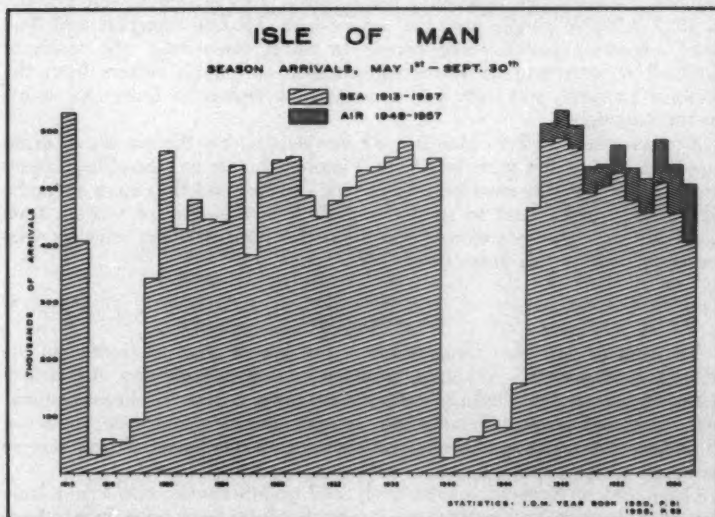
Most of the farms are very small, and the persistence of the size of the farms is an almost insurmountable limitation. Not counting several sheep farms of over seven hundred acres, of 1000 holdings, almost 800 have less than one hundred acres each, and at least twenty-five are less than fifteen acres. The boundaries of the treens and quarterlands are much older than the fields which they enclose: the field boundaries often betray the straightness and rectilinearity of recent subdivision. The majority of the treens encompass 100 acres (rather like the English hide or hundred), and within them, the quarterlands number four more often than any other number. The farms have boundaries, and often ownership lineage, of hundreds of years, and it would require the methods of a dictator to change this pattern; thus the tininess of the fields will always severely limit mechanization.

Approximately 16 per cent of the annual insular governmental income goes to support the agricultural programs, and this figure compares unfavorably with that of Britain, which is about 5.4 per cent.

## Tourism

To this little island of 50,000 inhabitants came 500,000 tourists and vacationers in 1958. On the single day of July 23, 1955, Douglas recorded 26,384 arrivals by sea. The level shingle near Ronaldsway, which was once a major beaching point for Viking longships, is now the site of the main Manx airport. Although the majority of visitors still make the four-hour sea voyage, over one hundred-fifty thousand visitors arrive each year by air.

Ancient and modern cultural patterns are found side by side. The rural peace of mountain and moor, magnificent coastal scenery, and old customs are being commercialized. The ancient ceremony of the promulgation of new laws of the Tynwald is broadcast annually by the B.B.C. from Tynwald Hill at St. John's, in both English and Manx. Although English has totally supplanted Manx as the language spoken, it was only at the turn of this century that the last person unilinguistic in Manx Celtic died. The pattern of government is Norse, and Manx and Norse names for street and stream, hill and home, tend to satisfy the tourists' need for foreign flavor.



The cellars of the homes which once stored smuggled goods, have now been converted into additional bedrooms to cope with the tremendous influx of visitors during the summer months. Where half a century ago the genteel used to promenade, now vacationers shriek on the Ferris Wheel amidst all the fun of the fair. On the roads where a farmer may yet be seen jogging along in his jaunty, is held the world-renowned Isle of Man Tourist Trophy Race. For two short weeks the thunder of racing motor cycles from the world's finest factories, twisting and turning on the mountain road around Snaefell, or swiftly circumventing the hazards of the sand-bagged streets of Douglas, becomes the life of the island.

The importance of artificial, or man-made attractions, and of their concentration in the Douglas-Onchan area, has resulted in an overwhelming proportion (about 80 per cent) of the accommodations for visitors being within one mile of the sea at Douglas Bay. There are probably more maitres d'hotel per square mile in Douglas during the season, than anywhere else in the world. In an area of less than two square miles, there are 400 hotels and boarding establishments. Yet, during the past decade, the volume of tourists has decreased by 3 per cent per year, whereas tourist movement in other parts of Europe has increased by almost 10 per cent per annum.

The island draws its holiday makers from the comparatively restricted area of the south Lancashire and south Yorkshire industrial conurbations which include some five and one-half million people. Eight turbine steamers of the Isle of Man Steam Packet Company are almost idle during the off-season but are overcrowded in summer when they carry 400,000 voyagers from Liverpool, Heysham, Dublin, Belfast, and Ardrrossan to Douglas. The pattern of the points of origin of air travelers to Man, is similar to that of the arrivals by sea, although the total is only 20 per cent of the number of sea-voyagers. The explosive growth of the air traffic is shown by the number of passengers handled at Ronaldsway. In 1947 there were 68,000; in 1957, 250,000 people used the air services. Modern transport and "pay later" vacations permit more people to travel sun-wards: the south of England is attracting an increasing number of holiday-makers from the north of England, and some join trans-Atlantic visitors to European resorts on the continent.

A holiday in the Isle of Man is quite inexpensive, but the accommodations provided behind the grim facade of Victorian hotels and boarding houses fronting Douglas Bay must be modernized, and this added to more energetic advertising, might tend to stem the decline in the flow of visitors from England, and have a welcome effect on the trans-Atlantic travelers who presently pass by this gem of the Celtic fringe.

## Conclusion

The reasons for this unique status of the Isle of Man are rooted in the island's environment. Although more and more approaching the British norm, the physical and cultural patterns are distinct from its closest counterpart, England, even allowing for a considerable difference in scale. Physically, the situation of the Isle of Man gave it the Norse cultural impress based on a Celtic heritage, that is unique in the British Isles.

Compared to England, qualitatively and quantitatively, the island lacks natural resources, and agriculture has to be subsidized with profits from tourism. The lack of wheat land and the reliance on multi-use-rotational pastures, rather than on acreage specifically allotted to grazing, distinguishes the Manx agricultural pattern from that of its neighbors. There is an increasing emphasis in pointing agricultural production to provide meat, milk, and vegetables for the tourists' tables.

The government is concerned to broaden the base of its economy. The tourist season offers employment for all who are not otherwise occupied: in fact, about one thousand persons from Ireland arrive annually just to obtain employment in the Isle of Man during the summer season, and return to their homes to live on that income for the remainder of the year. A Douglas jeweler told me that for eight months of the year his shop showed a loss

which is more than balanced by profits from the four summer months. The income of the Insular Government shows a similar pattern.

Man's neighbor, Northern Ireland, has attracted trans-Atlantic investment in industry, but the lack of port facilities, compared to Londonderry and Belfast, more than offset the attraction of Man being nearer to English markets.

Agriculture, although in a much more thriving state than in the past, is supported by government subsidies which would not be possible without the profits from the tourist industry.

This, then, is an island of specialization, and the decline in the number of visitors to the island suggests that continued reliance on tourism is unwise.

The Isle of Man has a political status equivalent to that of a Dominion at present: if the Manx economy fails, and more active participation by Parliament ensues, Tynwald may lose its domestic autonomy and Man may become just another English county. The confidence of the independent Manxmen that they will overcome their difficulties, is proclaimed beneath their three-legged national emblem:

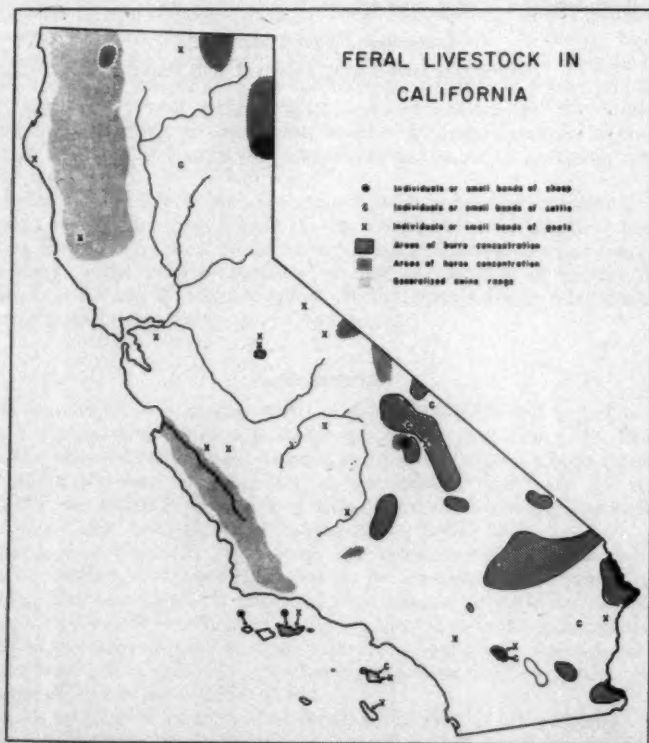
*Quocunque jeceris stabit:*  
whichever way I am thrown, I will stand.

## A SURVEY OF FERAL LIVESTOCK IN CALIFORNIA

TOM MCKNIGHT

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It is a well-known fact that California contains a large number of four-footed mammals. The state is a leader in domestic livestock, having more cattle than all but five other states and ranking third in numbers of sheep.<sup>1</sup> In terms of native wildlife, California also ranks high, with more deer than



<sup>1</sup> Crop Reporting Board, Agricultural Marketing Service, U.S. Department of Agriculture, *Livestock and Poultry Inventory, January 1*, Washington, D.C., February 13, 1961, pp. 12 and 18.



any other state, ranking third in numbers of bear, and counting more mountain sheep than all but five states.<sup>2</sup>

Not so well known is the fact that California is also a leader in another category of quadrupeds—livestock that have reverted to a wild existence. No state has a greater variety of feral livestock and probably only one or two can equal it. Within the confines of this state are feral populations of all common barnyard livestock: horses, burros, cattle, sheep, goats, swine, dogs, and cats. Some of them in considerable abundance.

The definition of the term "feral" is unprecise. In the general sense it refers to animals that have gone wild from a domesticated state, or descendants of stock that has gone wild. In the more practical sense it should probably be restricted to any domestic species which are able to maintain themselves and reproduce in the wild. However, as these animals are widespread in both "tame" and "wild" conditions, it is often quite difficult to distinguish among "feral," "semi-feral," and "non-feral." Who is to say which term is applicable to a given animal, no matter how adjacent or remote the nearest human habitation may be? Even such tell-tale domesticated signs as brands and ear notches are not certainties, as these marks may have been made months or even years earlier, with feralization having occurred since. It is difficult and often impossible to tell whether an individual animal, when seen in the wild, is under the effective ownership of anyone, or whether it receives either protection or food as a deliberate gift from man.

It should be mentioned that all of the species listed above, with the partial exception of the dog, are exotics; *i.e.*, not native to this continent. They were imported from various Old World sources, during the early days of exploration and settlement, as domestic creatures, and have assumed a feral existence in only a limited number of cases. In some instances feralization took place decades or even centuries ago, with dozens of generations of feral individuals resulting. In the majority of instances, however, it is fairly clear that the animals in question have only recently reverted from domesticity.

The basis for this study is a series of three extensive questionnaire-interview surveys over the past half-decade, which contacted some one hundred-eighty Californians who have personal familiarity with parts of the state where feral animals might be found. The data thus gathered were supplemented by field studies and library research. The result is the first detailed reconnaissance survey ever made of the feral livestock of the state.

## Burro

The most famous of California's feral exotics is the burro (*Equus asinus*). This creature has achieved considerable notoriety because of its desert habitat, its voracious appetite, its questionable decorum at water holes, its indomitableness when competing with native species, and the strong emotional reactions which tend to be generated among burrophobes and burrophiles.

On the basis of the questionnaire-interview surveys previously mentioned, it is estimated that there are between 2,000 and 5,500 feral burros in

<sup>2</sup> Fish and Wildlife Service, U.S. Department of the Interior, "Big Game Inventory for 1957," Wildlife Leaflet 399, September, 1958, pp. 1 and 2.

California, more than in any other state.<sup>3</sup> Nearly all are located in the basin-and-range country of the southeast. The largest numbers, from 500 to 1,000 in each case, are found in the Panamint Mountains, the Saline Valley area, and the varied desert and mountain area between Highways 91 and 66. Smaller populations are in the Coso and Argus Mountains, the Chemehuevi and Whipple Mountains, Clark Mountain, the eastern side of the Sierra Nevada south of Walker Pass, the Avawatz Mountains, the eastern side of Imperial County, and the Barton Flats area of the San Bernardino Mountains. Elsewhere in the state a few burros inhabit eastern Lassen County and the Merced River Canyon between Bagby and Hornitos.

The origin of feral burros in California can be traced back to the earliest days of exploration and colonization. When serving as pack animals these little asses, proved to be well suited and hence widely used throughout the desert and semi-desert areas, especially by prospectors, miners, and sheepherders. Much of this took place in remote regions, so feralization was a simple development when burros were set free, whether by accident or design. The freed animals apparently took readily to a feral life, and a large population built up through the decades. The increasing press of civilization in recent years has reduced the total to its present size.

The presence of "wild" burros in California, especially in sections where they occur in abundance, has stirred up a hornet's nest of controversy from time to time. Since they are extremely adaptable, they rapidly assume a dominant role in any situation competitive with native fauna. This may become crucial where water and/or forage are at a premium, which is likely to occur throughout the desert. The result is that the burro frequently overgrazes and abuses the desert flora, making vegetation survival difficult, accelerating soil erosion, removing cover for birds around water holes, and competing actively with the native bighorn sheep (*Ovis canadensis*) for food.<sup>4</sup> In addition, the burro is a very untidy water-user, apparently making water holes unfit for other animals to use from time to time. The result is that burros and bighorn sheep rarely occupy the same ranges, the bighorn invariably vacating a competitive situation.<sup>5</sup> As the bighorn is one of our most prized and rarer native species, it is only natural that much wrath would be loosed upon the head of such a competitor. Strict control measures are urged to limit the burro population.

On the other side of the controversy is the indignation felt by many Westerners at the thought of controlling (i.e., shooting or trapping or poisoning) the long-eared critter which contributed so much to the "opening" of the West. In most people's minds burros are equated with barnyards, and the deliberate removal of "man's uncomplaining servant and the playmate of his children"<sup>6</sup> meets with opposition. There are various other facets

<sup>3</sup> Tom McKnight, "Feral Burros in the American Southwest," *Journal of Geography*, Vol. 50, 1957, pp. 315-322.

<sup>4</sup> See Tom L. McKnight, "The Feral Burro in the United States: Distribution and Problems," *Journal of Wildlife Management*, Vol. 22, 1958, pp. 163-179.

<sup>5</sup> The most striking example of this is at Death Valley. The mountains on the eastern side of the Valley contain a considerable population of bighorn, at least partially because the National Park Service keeps burros away by vigorous control measures. However, in the Panamint Mountains on the western side of the Valley burros are found in profusion and bighorn are almost completely absent.

<sup>6</sup> Harold Weight and Lucille Weight, "A Word for Brother Burro," *Calico Print*, Vol. 9, 1953, pp. 2-4.



to the controversy and the interested reader can explore them elsewhere.<sup>7</sup>

In terms of management only California has recognized the burro in its game laws, with two significant burro laws in the state Fish and Game Code. The original "burro law" makes it a punishable offense to kill wild burros within the state. In addition, a large portion of the Saline Valley-Panamint Valley-Death Valley areas, consisting of some six thousand square miles, has been set aside as a burro sanctuary.<sup>8</sup> Outside the sanctuary burros may be captured for domestication purposes provided a permit is obtained from the California Department of Agriculture.<sup>9</sup>

This law is unique in several respects: (1) The state contains more feral burros than any other. (2) It is the only state that has recognized burros in its game laws. (3) Competition between burro and bighorn sheep is much more widespread in California than in any other state. (4) Here this feral exotic has been given almost complete protection in spite of the fact that it is causing major damage in some areas, as well as competing with native fauna. (5) Interest in, and sentiment in favor of, burros are much greater here than in any other state.

As its exact ecological role is better understood in the biotic dramas of our desert areas, plans for scientific management can be adopted.<sup>10</sup> At present the feral burro seems assured of survival in California, at least in Inyo, San Bernardino, Riverside, and Imperial Counties. An increase in population, with a possible spread to other areas, is likely, as legal control measures are quite limited and illegal controls are unlikely. Will the feral burro become the dominant wildlife form throughout the state deserts? The answer depends in large measure on future changes in the burro laws.

## Horse

It is reasonable to assume that feral horses became widespread in California at a later date than in most other western states, as dispersion of horses from Texas and New Mexico proceeded more rapidly in other directions. Nevertheless, by the middle of the nineteenth century there were large numbers of wild horses in the San Joaquin Valley, and presumably in other parts of the state.<sup>11</sup> It is thought that these original wild herds were populated largely by runaways from cattle or horse ranching operations. As the San Joaquin Valley was occupied by settlers, the horses

<sup>7</sup> See McKnight, *op. cit.*; Philip Ferry, "Burro or Bighorn?" *Pacific Discovery*, Vol. 8, 1955, pp. 18-21; Russ Leadabrand, "Long-eared Problem Child of the Desert," *Desert*, Vol. 19, 1956, pp. 10-12; E. L. Sumner, Jr., "When Desert Bighorn Meets Wild Burro," *Calico Print*, Vol. 8, 1952, pp. 3-7; Harold Weight and Lucille Weight, "Death or Refuge for our Desert Burros," *Calico Print*, Vol. 7, 1951, p. 2.

<sup>8</sup> Russ Leadabrand, "Burro Sanctuary on the Mojave," *Desert*, Vol. 20, December, 1957, pp. 5-7.

<sup>9</sup> James W. Koehler, "The California Undomesticated Burro," *Quarterly Bulletin*, California Department of Agriculture, Vol. 49, 1960, p. 4.

<sup>10</sup> At the present time a committee of naturalists, headed by Ralph Welles and Lowell Sumner of the National Park Service, is making the first detailed ecological study of the feral burro ever attempted in this country.

<sup>11</sup> W. H. Chamberlin, "From Lewisburg (Pa.) to California in 1849 (Notes from the Diary of William H. Chamberlin)," edited by L. B. Bloom, *New Mexico Historical Review*, Vol. 20, 1945, p. 242.

were forced to retreat into the surrounding hills and the spread of farming and ranching eventually forced them out of the valley entirely.

Feral horses also appeared in other parts of California. Strays from ranches, draft animals belonging to homesteaders who abandoned farming, escaped cavalry remount stock, and runaways from stage line service drifted into a feral existence in various portions of the southeastern deserts, and northeastern lava plateaus. These animals were able to maintain themselves for many years in the more rugged portions of their range, but in the last decade or two their numbers have been seriously depleted.

In occasional areas of concentration, the feral horses caused considerable range deterioration and sometimes provided major waterhole competition for livestock and wildlife. When this happened, there was usually a concerted effort by ranchers, Forest Service officials, or Bureau of Land Management graziers, to remove the horses. In the latter two cases, removal is accomplished by means of a "closing order." The Secretary of Agriculture authorizes the issuance of such an order for a certain area; notice is posted, and all stock-owners must round up their horses. Any horses that remain are presumed to be unowned and are considered as unlicensed trespass livestock, which are to be removed. In most cases, airplanes and cowboys make the first attempt at removal. After that, the trespass animals that escaped roundup may be shot by any authorized range management official.

This removal has been so effective that only relatively small herds of feral horses are left in California today.<sup>12</sup> The greatest concentration is in the extreme eastern parts of Lassen and Modoc counties, between Highway 395 and the Nevada border. In this rugged mountain and desert country live several hundred feral horses, with estimates ranging from three hundred to eight hundred. Many have been removed in the past and undoubtedly more will be rounded up in the future even though they are now so scattered that land use problems are few.

The Devil's Garden area of Modoc County (the lava beds country northwest of Alturas) has had a wild horse concentration for many decades, although few are left today. Barnes reports that there were more than ten thousand in this area about 1920.<sup>13</sup> However, persistent hunting and trapping have now reduced this total to less than a hundred. Closing orders issued by the Forest Service in 1951 and 1956 contributed materially to the decrease.

There may be a few other areas in northern California that have remnant bands of feral horses, but only one such area has been reported. There are several small bands, totaling perhaps fifty head, in the Goosenest District of Klamath National Forest in Siskiyou County.

Mono County has several bands of feral horses ranging widely in the Excelsior Mountains east and northeast of Mono Lake. This range actually is in Nevada for the most part, and contains an estimated one hundred-fifty to two hundred horses. As in other areas, it is but a remnant of once much greater numbers. Another sizeable group is reported from the northern portion of the White Mountains, which straddle the boundary between Mono and Inyo counties. It is estimated that two hundred and fifty to three hundred and fifty horses range in this area.

<sup>12</sup> Tom L. McKnight, "The Feral Horse in Anglo-America," *Geographical Review*, Vol. 49, 1959, pp. 519-521.

<sup>13</sup> W. C. Barnes, "The Passing of the Wild Horse," *American Forests and Forest Life*, Vol. 30, 1924, p. 647.

The Coso Mountains of Inyo County are credited with one hundred to one hundred and fifty feral horses. Presumably these herds got their start as late as the 1880's when the Junction Ranch (near Darwin) was used as a resting area for horses of the Carthay Stage Line string. Escapees from there and from other nearby ranches formed the nucleus. At present the wild horse range is confined mostly to government land on the China Lake Naval Ordnance Test Station. In addition, a very small remnant group is reported from Saline Valley, east of Lone Pine.

A few small bands are still found in the Tehachapi Mountains and adjacent parts of Antelope Valley in Kern County. It is estimated that this area had some fifteen hundred during the early 1940's, but most have been caught and sold to pet food processors. The remainder exist in the wildest, least frequented portions of the mountains, and seem to cause few problems except for occasional depredations on unfenced farm land in the Willow Springs area.

The only other feral horses in California are in small scattered bands in the southeastern portion. A few are reported to be in the Providence Mountains of San Bernardino County and in the Palm Canyon drainage of Riverside County.

The total number of feral horses in existence in the state today is apparently between eight hundred and eighteen hundred.<sup>14</sup> Relatively little attention is paid to them because they are few, scattered, and not much of a nuisance. There is more than a little possibility, however, that the near future will see an increase in numbers. Spurred on by "save the wild horses" sentiment, generated particularly in Nevada, Congress in 1959 enacted legislation prohibiting the use of motorized equipment in running down wild horses on federal lands. As most of the horses occur on federal lands, this is significant legislation. It means that airplanes and trucks may no longer be used to roundup mustangs, and it is quite unlikely that many wild horses can be taken without motorized help. Thus the "mustangers" and pet food processors are mostly removed from consideration as controls on the horse population, making the outlook quite favorable for an increase in feral horse numbers.

### Cattle

Cattle are the least common of the feral exotic species in California. Indications are that there are less (perhaps considerably less) than one hundred head in the state. Reports show small populations in the Granite and Santa Rosa Mountains of Riverside County,<sup>15</sup> the Bontgunwale Canyon area of Tehama County,<sup>16</sup> some remote parts of Santa Catalina Island,<sup>17</sup> and especially the Hunter Mountain area and the Grapevine Range of Death Valley National Monument.<sup>18</sup>

<sup>14</sup> McKnight, 1959, *loc. cit.*

<sup>15</sup> Personal communications, Bonnar Blong, California Department of Fish and Game, Idyllwild; Richard Weaver, California Department of Fish and Game, Riverside.

<sup>16</sup> Personal communication, Superintendent, Lassen National Forest.

<sup>17</sup> Charles Hillinger, *The California Islands*, Academy Publishers, Los Angeles, 1958, p. 38.

<sup>18</sup> Personal communication, E. Lowell Sumner, National Park Service, San Francisco.

For the most part these animals represent occasional strays that have eluded round-ups and established temporary feral existences. There is no positive evidence that they are actively reproducing or increasing anywhere. On the other hand, in some cases there have been feral cattle in these areas for many years, though always in small numbers.

Generally speaking the feral cattle are incidental and temporary in occurrence.

## Sheep

Most biologists who have considered the problem are convinced that domestic sheep are unable to take up a feral existence in the mid-latitudes with any degree of success, partly because of their lack of intelligence in protecting themselves against the vagaries of weather, but largely because of their ready susceptibility to predators. Most rules have exceptions, however, and one of the significant exceptions to the "no feral sheep" generalization is found on the Channel Islands off the coast of southern California. Insular isolation removes the possibility of predatory species, and the maritime influence provides a mild climate, so sheep can flourish on these islands, if given the opportunity.

All of the larger Channel Islands have had feral sheep in the past. San Miguel Island is a case in point.<sup>19</sup> The Navy, which administers most of the islands, permitted sheep-herding there in the 1930's. At the outbreak of World War II the sheep permit was revoked, and the herdsmen with their thousands of sheep were removed from the island. However, all of the sheep could not be captured, and a feral nucleus built up quite a population. Another effort was made in 1950 to remove the remaining sheep, and most of them were captured—not all, however, and the remnant presumably will build up again. The island was "enormously devastated" by the sheep in the past, but has been showing extensive recovery since 1950.

Today feral sheep are notable only on San Miguel and Santa Cruz.<sup>20</sup> There may, in addition, be small remnant populations on one or two other islands.

Feral sheep, then, can exist only where isolation provides protection from natural enemies and where a mild climate prevails. California's population is a museum-type example that is very real but somewhat unnatural. The situation is duplicated nowhere else in this country except on some of the Hawaiian islands.

## Goats

Goats have reverted to a feral existence in many parts of California, partly in desert areas and partly in wetter portions of the state. In general there are two types of situations involved: (1) In a variety of regions of rugged terrain and brushy vegetation, goats have wandered away from loose confinement or have been pastured on the open range with partial round-up failure. This has resulted in establishment of scattered small populations. (2) On various of the Channel Islands large numbers of goats

<sup>19</sup> Personal communication, Sumner.

<sup>20</sup> Hillinger, *op. cit.*, p. 99; Personal communications, Donald M. Robinson, Supt., Channel Islands National Monument, San Diego; Robert Norris, University of California, Santa Barbara; Phil Orr, Santa Barbara Museum of Natural History.



have ranged free from human control and unhampered by predators. In most cases the island goats were originally established many decades ago with deliberate colonies planted by sailors, fishermen, and ranchers.

Most of the mainland goats are of the ordinary milking variety, though some Angora goats are involved. On the islands they generally seem to be of old Spanish blood, with large heads and impressive horns and beards.

The principal mainland locations where feral goats have been reported in the last few years are listed:

(1) In the vicinity of Hall Canyon and Pleasant Canyon on the west side of the Panamint Mountains is an apparently static population of several dozen feral goats, apparently originating as escapees from Indian Ranch.<sup>21</sup> Their reproduction seems to be balanced by coyote predation, and there is no evidence of significant competition with native species. (2) Jones<sup>22</sup> reported about thirty feral goats in the Martinez Canyon area of Riverside County's Santa Rosa Mountains in 1953. They have been reported off and on several times since then. It was presumed that they originated by straying from a local ranch, though there is some evidence that their origin was much more ancient.<sup>23</sup> (3) Scattered localities in the desert mountains are reported to have a few feral goats, including the Big Maria Mountains and the Mount Eden area of the Moreno Badlands, both in Riverside County.<sup>24</sup> (4) Various locations in the western Sierra Nevada foothills support small populations, including the area around Delonegha Springs in Kern County (Angora goats at Delonegha Peaks and milk goats east of Mill Creek), the Black Mountain area in Fresno County;<sup>25</sup> the area between Coulterville and Groveland in Mariposa County;<sup>26</sup> in the canyon of the Tuolumne County.<sup>27</sup> (5) There are widely scattered localities in the coast ranges (mostly on the eastern slopes) where feral goats are reported, including the New Idria and Pinnacles areas in San Benito County;<sup>28</sup> the Mount Diablo area in Contra Costa County;<sup>29</sup> the west slope of Cow Mountain in Mendocino County;<sup>30</sup> and the King's Peak area of Humboldt County.<sup>31</sup> (6) Miscellaneous localities where goats are reported include Paoha Island in Mono

<sup>21</sup> Personal communications, Weaver; William C. Bullard, Death Valley National Monument; Russell K. Grater, National Park Service, San Francisco; Vernon Burandt, California Department of Fish and Game, Lone Pine.

<sup>22</sup> Fred Jones, "Report on the Survey of Bighorn Sheep in the Santa Rosa Mountains, Riverside County," *California Fish and Game*, Vol. 43, July, 1957, p. 190.

<sup>23</sup> Personal communications, Weaver; Blong; C. S. Robinson, Los Angeles; Fred Jones, California Department of Fish and Game, Sacramento.

<sup>24</sup> Personal communications, Weaver; George Werden, Blythe.

<sup>25</sup> Personal communications, Eldon E. Ball, Sequoia National Forest, Porterville; Wallace G. MacGregor, California Department of Fish and Game, Sacramento.

<sup>26</sup> Personal communication, Jens C. Jensen, Sacramento.

<sup>27</sup> Personal communication, Frank I. Barmettlor, U.S. Fish and Wildlife Service, Modesto.

<sup>28</sup> Personal communications, Bullard; Lowell Adams, U.S. Forest Service, Susanville.

<sup>29</sup> Personal communication, MacGregor.

<sup>30</sup> Personal communication, Earl L. Hubbs, University of California, Berkeley.

<sup>31</sup> Personal communication, Fred Ross, California Department of Fish and Game, Redding.



Lake,<sup>32</sup> the Coleville area of Mono County,<sup>33</sup> and the area immediately northwest of Lava Beds National Monument in Siskiyou County.<sup>34</sup>

The total number of feral goats in the mainland portions of the state probably does not exceed five hundred head, and may be appreciably less. As they occur in relatively small bands in widely scattered localities and do not appear to be increasing in numbers, their existence apparently creates no significant problems. Undoubtedly some forage depletion and accelerated soil erosion can be traced to feral goats in localized areas, but these conditions are relatively minor. The animals provide some sport hunting, though authenticated reports of hunter success are practically nonexistent. It is guessed that predators, especially coyotes, play a major role in preventing population growth. These small bands may be expected to exist without much change for the near future, with occasional additional escapees maintaining the status quo as attrition decreases the existent feral population.

For many decades feral goats have occurred in great numbers on some of the Channel Islands. An estimated fifteen thousand inhabited Santa Catalina at the time of the Civil War<sup>35</sup> and the number present there today is probably about the same. Many thousands more are found on San Clemente and smaller numbers on Santa Cruz.<sup>36</sup>

### Swine

Feral swine are traditionally associated with the southeastern states<sup>37</sup> but are found in other parts of the country as well. California probably has the largest feral hog population outside the old Cotton Belt, according to reports from almost all parts of the state:

(1) The counties of northern California contain the largest number of stray swine. They have been reported from practically every county of the Sacramento Valley and the northern coast ranges clear to the Oregon border.<sup>38</sup> The greatest concentrations seem to be found in Colusa, Mendocino, Tehama, Trinity, and Humboldt Counties, ranging in all sorts of terrain from rugged mountains to the gentle slopes around the edge of the Sacramento Valley. Apparently this part of the state has harbored feral swine

<sup>32</sup> Personal communications, A. Fausett, Inyo National Forest, Bishop; Fred Batchelder, County Agricultural Agent, Yerington, Nevada.

<sup>33</sup> Personal communication, Gene Gerdes, California Department of Fish and Game, Bishop.

<sup>34</sup> Personal communication, Robert C. Zink, Lava Beds National Monument, Tulelake.

<sup>35</sup> Hillinger, *op. cit.*, p. 49.

<sup>36</sup> Hillinger, *op. cit.*, pp. 37 and 135; personal communications, Norris; Jones; Sumner; Weaver; Orr; Adams; Robinson; Fred P. Cronmiller, U.S. Forest Service, San Francisco; Doug Propst, Santa Catalina Island Co., Avalon.

<sup>37</sup> R. P. Hanson and Lars Karstad, "Federal Swine in the Southeastern United States," *The Journal of Wildlife Management*, Vol. 23, January, 1959, pp. 64-74.

<sup>38</sup> Personal communications, MacGregor; Adams; Weaver; Jones; Leonard M. Hill, Bureau of Indian Affairs, Sacramento; A. Starker Leopold, University of California, Berkeley; Wilson Bjorge, Bureau of Land Management, Ukiah; William K. Barker, Bureau of Land Management, Redding; D. A. Longenbaugh, Hoopa Indian Agency, Hoopa; A. W. Ahlstrom, U.S. Fish and Wildlife Service, Sacramento; Evan M. Jones, Ukiah; Philip B. Lord, U.S. Forest Service, Susanville; E. R. Jackman, Extension Range Management Specialist, Corvallis, Oregon.

since the latter half of the nineteenth century. Originally, of course, fencing was scarce and many ranchers turned their hogs out to range freely, especially during acorn season. Feralization was commonplace under such circumstances. In the last few decades, however, fencing has been much more complete, and feralization involved distinct escape from some sort of confinement, which is not as easy but still quite possible. These hogs must contend with predators and a good deal of deliberate shooting by hunters and especially by ranchers, but seem to be almost holding their own in spite of being disliked. Many complaints have been received from ranchers who consider that the hogs cause serious damage to pasture lands and forage in general by their rooting habits. In addition, there are authenticated reports of young lambs and new-born calves being killed by hogs. As a result, many local landowners shoot feral hogs on sight, encourage sport hunters in this pastime, and occasionally even discourage coyote persecution on the grounds that coyotes are a deterrent to swine increase.

(2) A second area of significant feral swine occurrence is in the coastal ranges between Monterey and Santa Barbara, specifically in Monterey, San Luis Obispo, and Santa Barbara Counties.<sup>39</sup> The origin of these animals is similar to that of the northern California areas, though it is clear that in some places there has been interbreeding between the escaped domestic stock and European wild boars that have been "planted" for hunting purposes, especially in Monterey County. Relatively few complaints have been received about problems caused by swine in this part of the state, at least in part a reflection of the smaller numbers present. Sport hunting is of some interest, but public access to many of the ranches is difficult to obtain, and some of the larger ranches not only prohibit hunting but discourage publicity about the existence of feral swine.

(3) The desert of southeastern California contains a few feral swine in brushy sections marginal to water. For several decades there have been reports of occasional pigs encountered by fishermen and boaters along the Colorado River.<sup>40</sup> These are presumably the descendants of hogs turned out on the range by early residents to feed on mesquite beans, mixed with a few later escapees. Reports have also persisted through the years of feral swine around the southern and southwestern end of the Salton Sea.<sup>41</sup> Also, they are reported from the Afton Canyon area of the Mohave River in San Bernardino County.<sup>42</sup>

(4) Swine were introduced on the Channel Islands several decades ago. In some cases the feral porquines have interbred with European boars that were liberated. In any case, the contemporary "wild hogs" of the islands are big, strong, tusked, and relatively fierce. Several thousand are found on Santa Catalina (where they were deliberately imported from Santa Cruz

<sup>39</sup> Personal communications, Hill; Ross; Robert L. Fordice, California Department of Fish and Game, Orcutt; George Lawrence, Bakersfield College; S. A. Nash-Boulden, Santa Barbara; Roy U. Parker, Farm Advisor, Bakersfield; Arthur Hensley, California Department of Fish and Game, Los Angeles.

<sup>40</sup> Personal communications, Weaver; Werden; Robert Cowell, California Department of Fish and Game, Cima.

<sup>41</sup> Personal communications, Dr. G. K. L. Knott, Imperial County Veterinarian, El Centro; J. Clinton Spotts, California Department of Fish and Game, Apple Valley.

<sup>42</sup> Personal communications, Hensley.

about 1935 for the primary purpose of controlling rattlesnakes) and several hundred on Santa Cruz and Santa Rosa.<sup>43</sup>

The total number of feral swine in California can only be guessed. There are undoubtedly several hundred, perhaps a couple of thousand, in the northern part of the state. Another five hundred or so inhabit the southern coastal ranges. Probably less than one hundred exist in the desert. The Channel Islands may have several thousand. The grand total, then, would be in the neighborhood of three thousand to six thousand. This total is likely to decrease slowly in the future, as the pressure of civilization and hunting both increase. However, it is to be expected that small remnant populations of feral swine will exist indefinitely in varied parts of the state.

## Dog

The question of ferality, when applied to dogs, is even more difficult than usual. In the strictest sense it should be applied only to those canines that live apart from man, reproducing and maintaining themselves in the wild. And yet most cities contain stray dogs that are distinctly unowned and uncared-for, but live out their lives in urban areas, foraging in alleys, garbage cans, and parks, and actually propagating in sheltered nooks that abound in and near cities. Is the rural member to be considered "wild" while his urban cousin is merely classed as "vagrant?"

Of more significance to the study at hand is the distinction between unowned (feral) dogs and pets (domesticated) that go for a romp and act as if they were feral. In many cases this is a distinction that is difficult to make unless the animal in question is stopped by trap or bullet to permit a leisurely examination of his credentials. Some respondents indicated that feral dogs are abundant, while other reports from the same areas showed them to be nonexistent, a clear demonstration that ferality is often in the eye of the beholder.

The specifics of this question are beyond the capacity of this study, but the general situation in California is fairly straightforward. In practically every part of the state there are frequent reports of small bands of dogs and/or scattered individuals that roam the fringes of cities and towns, especially in the vicinity of river bottoms. Most of the bands seem to be fluid in composition, containing varying numbers of canines from time to time, although the constituency of some is more permanent. It is reasonable to assume, there being no evidence to the contrary, that most of the bands are composed largely (and sometimes entirely) of owned dogs, out for a few hours or a few days of pack life, and sometimes joining truly feral dogs in the process. In any case, the pack actions are feral. These animals commit serious depredations on poultry (chickens, turkeys, and geese), livestock (particularly sheep), domestic rabbits, and pets (especially small dogs). Agricultural and wildlife agents in many parts of the state receive numerous complaints attesting to this. It is generally considered that these dogs make heavier inroads on livestock and poultry than any native predatory species, including coyotes. In addition, there is considerable molestation of deer and other native fauna.

It is a general truism that dog packs, whether truly feral or merely free-

<sup>43</sup> Hillinger, *op. cit.*, pp. 13, 99; personal communications, Norris; Cronemiller; Orr; Robinson; Weaver; Propst.

ranging, are most common in the vicinity of human habitation, especially around towns and cities in agricultural areas. The most numerous reports emanate from the San Joaquin Valley, the Imperial Valley, and the Apple-Lucerne-Antelope Valleys. Considerable attention has been paid by the public press to occurrences in the hills and mountains immediately adjacent to Los Angeles and San Diego.

The Imperial Valley has had to face a special problem that deserves elaboration.<sup>44</sup> The problem is rabies, accentuated by the abundant importation of stray dogs from Mexico. At the outset it should be made clear that the Imperial Valley is a fertile origination area for feral dogs, even without such importations. There is plentiful brushy habitat, furnished by the New and Alamo river bottoms and 3,000 miles of irrigation and drainage canals, and appreciable small game and carrion (mostly derived from the dumping of sheep carcasses) to provide food. Thus dogs that strayed from the loose confinement of the many low-income families in the area, plus dogs that were abandoned as farmers moved away, have found that the feral life was an easy one in Imperial County. Before the mid-1950's many illegal Mexican aliens walked north from the Mexicali area into the Imperial Valley, often bringing one or more dogs with them. They would hire out as stoop labor, make some money, and ride back south to Mexico, leaving their dogs in the valley. During 1953-55 the U.S. Immigration Service finally cracked down on this situation, rounding up large numbers of aliens and trucking them back to Mexico, which generally left their dogs behind. This caused a rapid build-up in the stray dog situation. Further, Mexican dogs unaccompanied by humans, crossed the border in great numbers. The All-American Canal is roughly parallel to and just north of the border from the Colorado River to the west side of the Imperial Valley. Dogs very rarely swam across the wide, deep, steep-sided canal, but it was easy for them to walk across the unfenced drops that span the canal at several intervals.<sup>45</sup> The stray canine population continued to grow, and larger packs were observed from time to time.<sup>46</sup> In the fall of 1959, rabies, considered to be endemic in the valley, broke out in overt form. One case was reported in August, three in September, six in October, and 18 in November.<sup>47</sup> A Citizens Action Committee was formed and a countrywide quarantine was put into effect in which all dogs had to be vaccinated, tagged, and confined. Then, in a joint program of the U.S. Fish and Wildlife Service and the County Agricultural Commissioner's office, some two hundred poison bait stations were established, with up to thirty baits per station.<sup>48</sup> Over the three-month

<sup>44</sup> Most of the information in this paragraph was obtained from lengthy personal interviews with Dr. G. K. L. Knott, County Veterinarian, Imperial County, El Centro, and Claude Fennell, County Agricultural Commissioner, Imperial County, El Centro.

<sup>45</sup> It was found by examining paw-prints in the clear-swept sand area, maintained by the Immigration Service to detect illegal human immigrants, that up to one hundred-fifteen dogs per day were crossing into the Imperial Valley from Mexico.

<sup>46</sup> One pack was observed with 28 dogs in it, 24 of which were shot.

<sup>47</sup> Data copied from County Veterinarian's record book, El Centro, January 19, 1961.

<sup>48</sup> The typical bait station had one or two dead sheep as the central attraction. Scattered in a circle around the sheep carcasses were small pieces of fat pork with strychnine pills inside (little poison sandwiches that the animals can eat



quarantine period some eighteen thousand baits were set, and about six thousand animals, more than one-third of them stray or feral dogs, were killed. Rabies was essentially wiped out by the end of January, and incidentally the stray dog population was reduced to a fraction. However, the beginnings (two cases) of another epidemic were apparent by December, 1960, and the quarantine and poisoning programs were re-instituted, with immediate results.

It is clear that there is no feasible method for the elimination of the feral and stray dog problem in this state, nor is there any likelihood that free-ranging but owned dogs can be enjoined from forming destructive packs. In fact, there is every possibility that the situation will get worse before it gets better, as the population expands and more people have more dogs. The crux of the matter is that the dog is a domesticated animal and in an exo-domestic situation it is at best, pitiful, and at worst, destructive and dangerous. Man, of course, is actually at fault. People own dogs, but often do not take care of them. Promiscuous breeding is permitted at an astounding rate. Mature dogs are allowed to run loose for days or weeks on end. Countless canines are abandoned by careless or thoughtless owners. And last but not least there is an over-dependence on vaccination to "cure" rabies, a process that can only minimize but never eliminate. The only practical solution is regulation of our pets with proper care.

## Cat

If it is difficult to distinguish between feral and nonferal dogs, with cats it is downright impossible. No other domesticated animal can revert to the wild with the grace, skill, and rapidity of *Felis domestica*. Quiet and purring by the fireside one minute; noiselessly at home in a fir forest the next. Rare are cases when an individual animal can be identified as a truly feral cat, a stray alley cat, or a prowling tabby cat. But such distinctions are only incidental here; if the feline is in a wild area and behaving like a wild cat, it is of concern to this study. It should be pointed out, however, that after several years or generations in the wild, feral cats tend to become larger and more vicious than their housebroken cousins, surviving in true Darwinian style.

As with dogs, feral cats are found throughout the settled portions of California. In the remote back country they are apparently completely absent, but around the margins of civilization, and sometimes in the heart of civilization, they are commonplace. In three types of areas they are most abundant: (1) In cities and towns they exist in sheds, garages, barns, vacant lots, and abandoned houses. (2) Farming areas contain many, especially where there are brush-sided irrigation and drainage canals to provide cover and food. They are particularly noticeable in the San Joaquin, Imperial, and Sacramento valleys. (3) Summer resort areas frequently experience a high cat density as vacationists lose or abandon their pets. In mountain resorts there is heavy winter kill, but desert and seashore playgrounds are likely to have a large year-round cat population.

The feral (or stray or unconfined) cat is accused of many crimes, but the evidence is largely hearsay. Admissible evidence is unusually scarce,

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at a gulp). Most of the sandwich eaters died within a few hundred yards of the bait station.



although it must be admitted that circumstantial evidence is often overwhelming. Many competent biologists consider the feral house cat to be the most significant predator on the smaller forms of wildlife. It is generally considered (though again it must be pointed out that proof is usually lacking) that avian fauna is heavily preyed upon, particularly during nesting season. A further complication is the competition provided to native predators by these exotic house cats, particularly to coyotes, foxes, bobcats, ringtails, and raccoons. Occasional poultry destruction is also attributed to stray house cats.

What of the future for feral cats in California? Most predictors foresee an inevitable increase, associated with increased human population and the expansion of human settlement. Irresponsible ownership and cat abandonment show no signs of diminishing, so that again we must come face to face with the heart of the matter—humans do no kindness to the animal world when they fail to exercise the responsibility of ownership to their pets.

### Overview

The essence of their brief survey can be emphasized in a few summary statements:

Large numbers of feral livestock have occupied, and in some cases still occupy, the Channel Islands. These islands provide isolated museums for the study of various feral species in non-natural situations. The problems involved are real, but mostly atypical. This does not lessen interest in the specifics of the animals on the islands, but it does limit the application of generalizations. As the islands are mostly either under the control of the military or occur in single landholdings, they are well away from the mainstream of California life, and the feral exotics living there are chiefly of academic significance.

California's feral burro population is large, interesting, and occurs in considerable concentrations in localized areas. These animals will probably be with us for a long time to come, and are deserving of considerable research and planned management.

Feral horses are less numerous and cause fewer problems, but they should not be ignored.

Feral sheep and cattle on the mainland of the state are rare and incidental.

On the mainland, feral goats and swine occur in moderate numbers, but a few local concentrations cause problems. More definite management plans probably should be formulated.

Of all the feral animals, dogs and cats are the most widespread, the most troublesome, the least logical additions to the fauna, and at the same time the species that are dearest to the human heart and least likely to diminish in the future. Straight thinking is difficult here, because emotions are involved, but stricter controls are inevitable in the future.

While specific recommendations should not be made by a layman on the basis of a broad survey, certain general conclusions appear:

(1) Feral livestock are widespread over the state. No county is without at least a few representatives. This ubiquitousness is the first significant fact.

(2) Even so, there is a general ignorance, lack of recognition, or at least lack of agreement among the public and many management officials about the presence of the species mentioned.

(3) The advantages and disadvantages resulting from the presence of the animals varies considerably from species to species.

(4) There is a distinct lack of public understanding and sympathy for the management of feral barnyard animals. The layman often feels that he "knows" these animals and is as well qualified as biologists and wildlife technicians to give advice on management. Sometimes surprisingly strong feelings result.

(5) These feral species are exotic to California, and in some cases cause a distinct imbalance of nature. Care should be taken to see that no native species suffers unduly from competition with the exotics.

(6) The problems caused by the presence of the feral species are usually not large. There are significant exceptions, of course, as with dogs in the Imperial Valley, sheep on Santa Cruz Island, or burros in some parts of the desert. In general the problems are of a localized or minor nature.

(7) In general, *Homo sapiens* should be indicted for his irresponsible ownership as manifested in the occurrence of feral populations of *Equus asinus*, *Equus caballus*, *Bos taurus*, *Ovis aries*, *Capra hircus*, *Sus scrofa*, *Canis familiaris*, and *Felis domestica*.

## TWENTY-FOURTH ANNUAL MEETING

### San Francisco State College, April 6-7, 1961

The Association of Pacific Coast Geographers met on April 6 and 7, 1961, with San Francisco State College as the host institution and Prof. Lyle Gibson, as Chairman of Local Arrangements.

At the annual dinner on April 7 Dr. Edward T. Price of Los Angeles State College presided and Dr. Marion E. Marts, University of Washington, gave the presidential address.

#### *Program*

- GORDON R. LEWTHWAITE, *San Fernando Valley State College*  
"Dairying in the Midwest and New Zealand: A Comparative Study"
- MARTYN J. BOWDEN, *University of California, Berkeley*  
"Nuclear Power in the United Kingdom: Locational Analysis and Future Prospects"
- BENJAMIN E. THOMAS and JOHN B. WHITTOW, *University of California, Los Angeles*  
"Climate and Economic Activity in the Somali Country"
- WILLIS B. MERRIAM, *Washington State University*  
"The Mushroom Industry at Kennett Square, Pennsylvania"
- LELAND R. PEDERSON, *University of California, Berkeley*  
"Iron Ore Mining In Chile"
- YEHUDA KEDAR, *University of California, Los Angeles*  
"A New Approach to Classification of Agricultural Regions of the World"
- ROY I. WOLFE, *University of Washington*  
"Geographic Techniques of Highway Planning"
- WILLIAM BYRON, *Los Angeles State College*  
"The Development of Large-Scale Population Dot Maps from Settlement Data: An Experiment in Graphics"
- ROBERT LAMB, *San Fernando Valley State College*  
"Origin of the Mule"
- TOM MCKNIGHT, *University of California, Los Angeles*  
"Feral Livestock in California: Current Conditions"
- KENNETH THOMPSON, *University of California, Davis*  
"Trees in the Pristine Sacramento Valley"
- BILL HANNESON, *University of Oregon*  
"Plant Succession on the Clatsop Plains Since 1840"

- SAMUEL N. DICKEN, *University of Oregon*  
 "Some Recent Physical Changes on the Oregon Coast"
- ROBERT E. STEVENSON, *University of Southern California*  
 "The Nearshore Ocean and Coastal Climates"
- BOB DURRENBERGER, *San Fernando Valley State College*  
 "Operation Pea Soup: An Investigation of Fog-Dispersal Techniques"
- WILLIAM M. MCKINNEY, *Southern Oregon College*  
 "Russell Hinman, Pioneer Physical Geographer"
- ALFRED R. SUMNER, *San Francisco State College*  
 "The Geography of Space"
- HARRY BAILEY, *University of California, Los Angeles*  
 Chairman of Panel: "Graduate Training in Geography," a discussion of its objectives, curriculum, nature, and trends of research interests.
- RICHARD COPLEY, *University of California, Berkeley*  
 "Place Names in China"
- WILLIAM C. CLARKE, *University of California, Berkeley*  
 "Geographic Appraisals of the Island of Dominica, West Indies"
- HOWARD H. MARTIN, *University of Washington*  
 "Trans-Sierra Passes and Migration Routes: A Preliminary Appraisal"
- JULIAN MINGHI, *University of Washington*  
 "Point Roberts: An American Exclave"
- NORMAN DLIN, *University of California, Los Angeles*  
 "The Christian Lebanese in the Los Angeles Area"
- RONALD A. HELIN, *University of California, Los Angeles*  
 "The Finno-Soviet Boundary: Some Effects upon Human Activity in the Immediate Boundary Environs of Southeastern Finland"
- VINCENT K. SHAUDYS, *Montana State University*  
 "Geographic Consequences of Establishing Sovereign Political Units"
- JAMES E. BROOKS, *Portland State College*  
 "Curricular Geography and Frontiersmanship"
- LOUIS GUZMAN, *San Fernando State College*  
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- RHYNSBURGER, WILLERT, Regional Influences Upon the Canadian Railway Pattern, 27-32, 1949
- RICE, JOHN G., Creeper Gate: Sheep Station in the Australian Outback, 51-53, 1958
- RICHARDSON, R. W., Wind and Trees, 41-47, 1941
- ROBINSON, J. LEWIS, The Development and Status of Geography in Universities and Government in Canada, 3-13, 1951
- ROCKIE, W. A., The Palouse, 3-10, 1953
- Rogue River Country of Oregon: A Study in Regional Geography, The, by Samuel N. Dicken, 3-18, 1952



- ROSTLUND, ERHARD, Fishing Among Primitive People: A Theme in Cultural Geography, 26-32, 1948
- RUDD, R. D., An Alternate Application of the Köppen Classification to Eastern Oregon, 31-38, 1959
- Russian America, Historical Geography of, by Willis B. Merriam, 18-23, 1937
- Salmon, Conservation of the Frazer River Sockeye, by Willis B. Merriam, 46-53, 1954
- Salmon Industry, The Alaskan—Prologue and Prospect, by Raymond S. Mathieson, 35-45, 1954
- Salt Lake Milkshed, The Historical Geography of the, by Robert L. Layton, 34-39, 1952
- Samples of Rural Land Use, Some Problems in Designing, by Rodney Steiner, 25-28, 1957
- San Gabriel Mountains, California, Land Forms of the, by Joseph E. Williams, 16-32, 1941
- San Luis Obispo County, California, The Italian-Swiss Dairymen of, by H. F. Raup, 3-8, 1935
- San Pedro Valley Region, Arizona, Types of Pediments in the, by Tuan Yi-fu, 17-24, 1954
- Sandy Areas of the North American Desert, The, by Forrest Shreve, 11-14, 1938
- Settlement in Oregon, Two Isochronic Maps of, by Georgia E. Adams, 36-41, 1956
- Sheep Station in the Australian Outback, Creeper Gate:, by John G. Rice, 51-53, 1958
- SHERMAN, JOHN C., Sustained Yield Forestry in the Puyallup Valley, Washington, 19-22, 1949
- SHREVE, FORREST, The Edge of the Desert, 6-11, 1940
- SHREVE, FORREST, The Human Ecology of Baja California, 9-13, 1935
- SHREVE, FORREST, The Sandy Areas of the North American Desert, 11-14, 1938
- SHREVE, FORREST, Vegetation of Northern Mexico, 3-5, 1942
- Skykomish Valley, Migratory Work Waves in the, by Leonard C. Ekman, 5-10, 1936
- Smog, Los Angeles, by John W. Reith, 24-32, 1951
- Snow as an Environmental Factor in the West, by Phil E. Church, 7-14, 1947
- Snow Cover in Washington, Type Curves and Duration of, by Phil E. Church, 21-25, 1940
- Soils of the Eastern San Joaquin Valley, The Salt and Sodium Affected, by Chester F. Cole, 27-34, 1958
- SOPHER, DAVID E., Cultural Landscapes of Portuguese India, 34-39, 1960
- SOPHER, DAVID E., Turmeric: A Geographical Investigation of Cultural Relations in Southeast Asia, 11-15, 1950
- Southern California, Piedmont Plain Agriculture in, by H. F. Raup, 26-31, 1940
- Soviet Territorial Annexations in Eastern Europe, by Huey Louis Kostanick, 14-18, 1951
- Soviet Union, Livestock Organization in the Formerly Nomadic Livestock Areas of the, by Howard K. Albano, 57-62, 1956
- Soviet Union, The Development and Significance of Tea Cultivation in the, by Robert M. Bone, 63-73, 1956
- SPENCER, JOSEPH E., Preliminary Notes on Shifting Cultivation in Southeastern Asia, 49-51, 1958

- STEINER, RODNEY, Some Problems in Designing Samples of Rural Land Use, 25-28, 1957
- Sugar Industry of the Western United States, In Defense of the, by Harold A. Hoffmeister, 3-9, 1948
- Tacna-Arica Problem, An Unsolved Phase of the, by George McCutchen McBride, 10-14, 1936
- Tea Cultivation in the Soviet Union, The Development and Significance of, by Robert M. Bone, 63-73, 1956
- THOMAS, BENJAMIN E., Limits for American Deserts and Oases, 39-48, 1955
- THOMAS, BENJAMIN E., Transport in the Algerian Sahara, 19-23, 1951
- THORNE, D. W., and D. A. ANDERSON, Irrigation and Permanent Agriculture, 6-14, 1942
- Tin Can Industry in California, The, by Glenn Cunningham, 11-16, 1953
- Trade Routes for Sea Shells in the Southwest, Aboriginal, by Donald D. Brand, 3-10, 1938
- Transport in the Algerian Sahara, by Benjamin E. Thomas, 19-23, 1951
- Transportation in the Fairbanks Area, The Role of, by Robert L. Monahan, 7-21, 1959
- Tree Farming in the Douglas Fir Region: An Evaluation, by Granville Jensen, 21-26, 1955
- Trees, Wind and, by R. W. Richardson, 41-47, 1941
- Turmeric: A Geographical Investigation of Cultural Relations in Southeast Asia, by David E. Sopher, 11-15, 1950
- Underdeveloped Nations, Industrializations: A Panacea for, by Langdon C. White, 3-20, 1955
- Upturn Down Under, by Donald W. Meinig, 54-56, 1958
- Uranium Boom in the Colorado Plateau, A Story of the: Ram Pasture and Wall Paper, by Elbert E. Miller, 27-33, 1955
- Urban Patterns, Areal Political Structure and Its Influence on the, James E. Vance, Jr., 40-49, 1960
- Utah Administrative Units, The Geographic Factor and Its Influence on, by George H. Hanson, 3-8, 1937
- Utah Farm Village, Modifications of the Early, by Joseph A. Geddes, 15-22, 1942
- Vegetation of Northern Mexico, by Forrest Shreve, 3-5, 1942
- VANCE, JAMES E. JR., Areal Political Structure and Its Influence on Urban Pattern, 40-49, 1960
- WALKER, DARTHULA, Adjustments to the Climate of the Llano Estacado Region of Texas, 10-15, 1937
- Washington, The Changing Hydrologic Pattern of the Renton-Sumner Lowland, by John O. Dart, 19-23, 1952
- Water Planning in the Great Central Valley, California, by Peveril Meigs, 25-28, 1938
- Water Planning in the Willamette Basin, by Richard M. Highsmith, Jr., 16-26, 1950
- Water Power Development on the Loup River in Nebraska; A Study in Economic Geography, by Ralph E. Olson, 23-27, 1937
- Water Resource Policy Implications of the Hells Canyon Controversy, by Marion E. Marts, 32-37, 1953
- Wheat Culture in the Columbia Plateau, Climate and: The Evolution of Understanding an Environment, by Donald W. Meinig, 25-34, 1954
- Wheat Route, The Hudson Bay, by Russell S. McClure, 20-25, 1938

- WHITE, C. LANGDON, *Industrialization: A Panacea for Underdeveloped Nations*, 3-20, 1955
- WILLIAMS, JOSEPH E., *Land Forms of the San Gabriel Mountains, California*, 16-32, 1941
- Willamette Basin, *Water Planning in the*, by Richard M. Highsmith, Jr., 16-26, 1950
- Wind and Trees, by R. W. Richardson, 41-47, 1941
- World Affairs, *Geographic Research and*, by John B. Appleton, 3-7, 1947
- YI-FU, TUAN, *Types of Pediments in the San Pedro Valey Region, Arizona*, 17-24, 1954

## Part II—ABSTRACTS

- Agricultural and Settlement Landscapes of the Occident and Orient, Symposium arranged by Joseph E. Spencer and Joseph E. Williams, 53, 1941
- Agricultural Regions of British Columbia, by J. Lewis Robinson, 45-46, 1953
- Agricultural Trends in Western Washington, by Frances M. Earle, 25-26, 1936
- Air Transportation in the Far East, by G. Etzel Percy, 49-50, 1948
- Alaska Salmon-Canning Industry, *The Function of Water Transportation in the*, by Robert N. Young, 35, 1947
- Alaska, *The Seward Peninsula of*, by Howard J. Critchfield, 49, 1948
- Alaskan Livestock Industry, *Development and Possibilities of an*, by W. T. White, 39-40, 1940
- ALBRIGHT, JOHN C. JR., *The Petroleum Industry of the Los Angeles Lowlands*, 38, 1953
- ALEXANDER, CHARLES S., *Marine and Stream Terraces of the Capitola-Watsonville Area, California*, 32, 1950
- ALLEN, AGNES M., *The Geographic Setting of the Middle Rio Verde Valley*, 31-32, 1938
- Altitude: *Its Role in the Geography of Man in the High Peruvian Sierra*, by Langdon White, 37-38, 1951
- Among Those Present, by John C. Crosby, 15-18, 1957
- ANDERSON, ESTHER S., *A New Series of Crop and Livestock Annual Variability Maps of Nebraska*, 29-30, 1937
- Antarctica, *Ice-Free Areas ("Oases") in*, by Robert S. Dietz, 44, 1947
- Anthropogeography of the Cascade Highlanders, by Claude W. Cox, 21, 1936
- Antioqueno Colonization in Northwestern Colombia, by James J. Parsons, 44, 1947
- ANTRIE, ALBERT C., *Geography in the Secondary Schools of Utah*, 36, 1950
- APPLETON, JOHN B., *Northern Nigeria—A Study in Political Geography*, 22-23, 1935
- ARBINGAST, STANLEY A., *Port Arthur-Fort William, The Canadian Lakehead*, 33, 1949
- ASCHMANN, HOMER, *A Geographic Approach to Some Technical Problems of Commercial Aviation*, 42, 1947
- Australia, *Utilization of the Brown Coal Deposits of Southeast*, by Graham H. Lawton, 36-37, 1949
- Avocado Growing, *World Distribution of*, by Donald Eidemiller, 43-44, 1948
- Aviation, *A Geographic Approach to Some Technical Problems of Commercial*, by Homer Aschmann, 42, 1947
- BAILEY, HARRY P., *An Equal Area Grid Formed of Meridians and Parallels*, 38-39, 1953

- BAILEY, HARRY P., On Summer Dry Climates, 41-42, 1951
- Balkans, Problem Areas of the, by Huey Louis Kostanick, 35-36, 1950
- BARRETT, W. J., Marine and Stream Terraces of the Southeast Coastal Plain of the Dominican Republic, 62, 1954
- BAUER, FRANCIS H., Marine Terraces in the Vicinity of Fort Ross, Sonoma County, California, 32-33, 1950
- BAUGH, RUTH E., Adjustments to Declining Water Resources in the Antelope Valley, California, 40-41, 1951
- BAUGH, RUTH E., The Site of Early Los Angeles, 50-51, 1941
- BAYLOR, J. WRIGHT, Soil Erosion as a Geographic Determinant in the Northwest, 26-27, 1936
- BAYLOR, J. WRIGHT, Soil Conservation Instruction in Common Schools and Colleges, 29-30, 1938
- BAYLOR, J. WRIGHT, Geographic Aspects of Columbia River Development, 47, 1940
- BEAMER, CAROL C., The Alaskan Taku Wind, 38, 1947
- BEAMER, CAROL C., The Structure of Summer Wind Over San Juan Island, Washington, 31, 1937
- BELDON, WILMA, Iron Ore Resources of China, 28, 1935
- Beverly Hills, California: An Exclusive Residential Enclave, by Donald J. Dabney, 39-40, 1953
- BISSELL, MALCOLM, Sites of Prehistoric Community Houses in the Chaco Canyon Region, New Mexico, 48, 1941
- BISSELL, MALCOLM H., What Is the Warmest 'Month'? 29, 1935
- BOOS, MARGARET FULLER, The Physiographic Expression of the Indian Creek Plutons of the Denver Mountain Parks Region, Colorado, 30-31, 1937
- BOOS, MARGARET FULLER, and HERBERT E. WINCHESTER, The Urban Pattern of Denver, Colorado, 33, 1937
- BOSCHEN, ANNA MARIE, A Modification of the Koppen Criteria for Determining Seasonal Distribution of Precipitation, 26, 1935
- Bridgeport Bar, Washington, Sequent Land Use of, by Edward C. Whitley, 29, 1950
- Brigham City, Utah: The Only Incorporated Communistic City of Its Age, by Charles M. Chestnutwood, 30, 1950
- Britain, The New Role of Geographers in, by Dudley L. Stamp, 40, 1949
- British Columbia, Physical Geography of the Upper Peace River Area, by J. D. Chapman, 35-36, 1949
- British Columbia, The Influence of the Hinterland Upon the Urban Pattern of Nanaimo, by Marion H. Matheson, 34-35, 1949
- BROEK, J. O., Notes on Population Changes in the Coast Ranges of Northern California, 38, 1939
- BROOKE, CLARKE H. JR., The Razor Clam Fishery of the Washington Coast, 50-51, 1952
- BROWNING, CLYDE E., Metropolitan Affinities of the Middle Shenango Valley Towns, 52, 1952
- BUDGE, S. ELLIOTT, The Cheese Industry of Bear Lake Valley, Idaho, 30-31, 1950
- BULL, H. O. N., The Agricultural and Economic Conditions of Egypt, 43, 1948
- BUONCRISTIANI, JOHN J., Geography in the Junior Colleges, 51, 1941
- Cache Valley, Dairyland of Utah, The, by Elbert E. Miller, 55, 1952

- CALDWELL, HARRY H., *Recreational Land Use in the North Idaho Lake District*, 39, 1953
- CALDWELL, HARRY H., *Blaine and Fremont Counties, Idaho: A Study in Comparative Tourism*, 36, 1950
- California Mapping Plan, The, by Willis H. Miller, 52-53, 1941
- California Orchards and Vineyards, Maps of Current Trends in, by Peveril Meigs, 50, 1941
- California, The Simi Valley, Ventura County, by Robert M. Glendinning, 10, 1938
- CARLS, J. NORMAN, *The Seamless Hosiery Industry of Laconia, New Hampshire*, 31, 1936
- CARLS, NORMAN, *Studies in the Urban Geography of Portland, Oregon*, 37, 1940
- CARLSON, S. LUCILE, *Duwamish River: Its Place in the Seattle Industrial Plan*, 47-48, 1948
- CARLSON, S. LUCILE, *Human Energy, Physical and Emotional, Under Varying Weather Conditions*, 39-40, 1948
- CARROLL, JUNE, *The Leonis Valley-Elizabeth Lake Area, a Part of the San Andreas Fault Zone in Southern California*, 41, 1947
- CARSTAIRS, MARGARET, *The Evolution of an Olympic Peninsula Timber Town*, 34, 1947
- CARSTAIRS, MARGARET, *The Intensification of Agriculture in Sub-Tropical Japan*, 37, 1939
- Cartobibliography and the Uses of Such Data, Techniques in the Compilation of a*, by Edward L. Chapin, 47-48, 1951
- Cattle Industry in the Southern United States, Revolution in the Beef*, by Lauren C. Post, 44-45, 1953
- Cattle Breeds, An Aspect of Regional Geography*, by Lauren C. Post, 51-58, 1959
- CHAMBERLAIN, JAMES F., *Chicago: A Study in Urban Geography*, 32, 1938
- CHAMBERLAIN, JAMES F., *Geography in the Secondary Schools of the Pacific Coast States*, 21, 1935
- CHAPIN, EDWARD L., *Techniques in the Compilation of a Cartobibliography and the Uses of Such Data*, 47-48, 1951
- Cheese Industry of Bear Lake Valley, Idaho, The*, by S. Elliott Budge, 30-31, 1950
- CHESTNUTWOOD, CHARLES M., *Brigham City, Utah: The Only Incorporated Communistic City of Its Age*, 30, 1950
- Chicago: A Study in Urban Geography*, by James F. Chamberlain, 32, 1938
- Chinese Colonial Frontier, Renewed Expansion Along an Old*, by Joseph E. Spencer, 52, 1941
- Chinese Nationalism, The Background of Modern*, by Theodore Herman, 58, 1952
- Chorology and Conservation*, by A. W. Kuchler, 48, 1941
- CHURCH, PHIL E., *Climates of the Puget Sound Lowland*, 19-20, 1936
- CHURCH, PHIL E., *Mountains as a Climatic Control*, 38-39, 1947
- City, The Application of the Concept of Optimum to the Size of the*, by William L. Garrison, 49, 1951
- CLARK, VINNIE B., *Field Work Suited to Freshman Classes*, 29, 1935
- CLEVINGER, WOODROW R., *Natural Resources of the Palau Islands*, 41-42, 1948
- CLEVINGER, WOODROW R., *A Photographic Interpretation of Arctic Alaska*, 51-52, 1952
- CLEVINGER, WOODROW R., *Rubber Terrain Models (Navy Training Film)* 47, 1948



- CLEVINGER, WOODROW R., Wild Plants and Minor Forest Products of Western Washington, 47, 1940
- Climate, A Rational Classification, Oregon's, by Edward J. Jones, Jr., 53-54, 1952
- Climates of California, The New Thornthwaite Classification as Applied to the, by Clyde P. Patton, 33-34, 1950
- Climates of the Puget Sound Lowland, by Phil E. Church, 19-20, 1936
- Climates, On Summer Dry, by Harry P. Bailey, 41-42, 1951
- Climatic Control, Mountains as a, by Phil E. Church, 38-39, 1947
- Climatic Types in California, Areal and Annual Variations of, by Arch C. Gerlach, 50, 1941
- Climax, Colorado, The Environmental Factor of High Altitude at, by John H. Thompson, 37-38, 1947
- Coal Mining Decline in the Danville District, Illinois, Causes of, by John W. and Gertrude M. Reith, 45, 1953
- Coal Resources of China, by Barbara Woodruff, 13, 1935
- COLE, CHESTER F., Fresno County's Agriculture Related to Soils and the Availability and Quality of Irrigation Water, 35-36, 1951
- COLE, CHESTER F., A Study of Vashon Island, 45, 1940
- Colorado, The Range Cattle Industry of Northwestern, by Kay DeKraay, 41, 1940
- Colorado's Irrigated Oases, "Corn Belt" Cattle Feeding in, 41, 1953
- Columbia River Development, Geographic Aspects of, by J. Wright Baylor, 47, 1940
- Colville Valley, Washington, Land-Use Planning and the, by Francis J. Schadegg, 42-43, 1948
- Commonwealth of Nations: A Geographer's Solution, by Warren D. Smith, 31-32, 1942
- Conservation in Wallowa County, Oregon, by Samuel N. Dicken, 62-63, 1954
- Constantine, Algeria: Fortress and Trade Center, by Benjamin Thomas, 46, 1953
- Continental Displacement, The Importance of the Pacific Basin in, by L. T. Hansen, 44-45, 1947
- COOMBS, HOWARD A., The Physiography of Western Washington, 20, 1936
- Cooperatives, Geographical Influences Affecting the Success of Agricultural Marketing, by Andrew W. Wilson, 40, 1947
- CORFIELD, GEORGE S., The Sponge Industry of the Caribbean Area, 34, 1937
- Corvallis-Albany Urban Center, Regional Basis for Population Increase of the, by J. Granville Jensen, 42, 1947
- COX, CLAUDE W., Anthropogeography of the Cascade Highlanders, 21, 1936
- Cranberry Industry of Western Washington, The, by Albert L. Seeman, 46, 1940
- CRITCHFIELD, HOWARD J., The Seward Peninsula of Alaska, 49, 1948
- Crop and Livestock Annual Variability Maps of Nebraska, A New Series of, by Esther S. Anderson, 29-30, 1937
- CROSBY, JOHN C., Among Those Present, 15-18, 1957
- CROSBY, JOHN C., A Method of Third Dimensional Relief Representations, 59, 1952
- CUNNINGHAM, GLENN, The Quirigua Region of Guatemala, 19, 1935
- Cuyama: Land of Dramatic Change, The, by Richard F. Logan, 45, 1951
- DABNEY, DONALD J., Beverly Hills, California: An Exclusive Residential Enclave, 39-40, 1953
- DALE, F. G., A Cooperative Method of Mapping Land Utilization, 32-33, 1937

- Dams, Development at Three Pacific Northwest, by Otis Freeman, 35, 1950
- DANSEREAU, PIERRE, Structural and Climatic Units in the Vegetation of New Zealand, 37-38, 1949
- DAVIS, N. F. G., The 'Chitemene' System of Northeastern Rhodesia, 42-43, 1940
- DEKRAAY, KAY, The Range Cattle Industry of Northwestern Colorado, 41, 1940
- Denver: An Urban Analysis, by Howard H. Martin, 33, 1947
- Des Moines: Origin and Growth, by Howard J. Nelson, 29-30, 1950
- DICKEN, SAMUEL N., Conservation in Wallowa County, Oregon, 62-63, 1954
- DICKEN, SAMUEL N., Notes of Small Area Studies Illustrated by Oregon's McKenzie Valley, 39, 1951
- DIETZ, ROBERT S., Ice-Free Areas ("Oasis") in Antarctica, 44, 1947
- Duwamish River: Its Place in the Seattle Industrial Plan, by S. Lucile Carlson, 47-48, 1948
- EARLE, FRANCES M., Agricultural Trends in Western Washington, 25-26, 1936
- EARLE, FRANCES M., The Earthquake: An Agricultural Hazard in Japan, 45-46, 1947
- EARLE, FRANCES M., The Evolving Transportation Pattern of the Pacific Northwest, 40, 1953
- EARLE, FRANCES M., Land Ownership in Hawaii and Its Influence on the Local Economy, 32-33, 1947
- Egypt, The Agricultural and Economic Conditions of, by H. O. N. Bull, 43, 1948
- EIDEMILLER, DONALD I., The Greenhouse Flower Industry of the San Francisco Bay Area, 45, 1947
- EIDEMILLER, DONALD I., World Distribution of Avocado Growing, 43-44, 1948
- EKBLAW, SIDNEY E., Traffic on the Missouri River, 44-45, 1948
- EKMANN, LEONARD C., The Occupation and Abandonment of Tye: A Cascade Mountain Community, 28-29, 1937
- Equal Area Grid Formed of Meridians and Parallels, An, by Harry P. Bailey, 38-39, 1953
- ERWIN, WILLIAM A., JR., Urban Rivals of the Middle Rogue River Valley, Oregon, 57-58, 1952
- Eugene, The Geography of, by Warren D. Smith, 48, 1948
- Everett, Washington, Factors in the Growth of, by Leda Hamilton, 37-38, 1940
- FAIRBANKS, H. W., The Need for a Harmonious and Aggressive Front on the Part of School Geographers, 30, 1935
- FARRELL, BRYAN H., The Ahuriri Lagoon, New Zealand: A Study of an Evolving Habitat, 39, 1949
- Fertilizer Industry of the Pacific Northwest, The, by John W. Gierhart, 63, 1954
- Field Work Suited to Freshmen Classes, by Vinnie B. Clark, 29, 1935
- Fisheries, Production Trends in the Northwest, by Enid L. Miller, 22, 1936
- Forest Products of Western Washington, Wild Plants and Minor, by Woodrow Clevinger, 47, 1940
- Forest Situation in Western Washington, The, by Willis B. Merriam, 28-29, 1936
- FREEMAN, OTIS W., Development at Three Pacific Northwest Dams, 35, 1950
- FREEMAN, OTIS W., Changing Scenes in Hawaii, 37, 1949
- FREEMAN, OTIS W., Geography in Far-Western Institutions of Higher Learning, 50, 1948
- FREEMAN, OTIS W., The Geography of State Parks; a Comparison Between Indiana and Washington, 36, 1947

- FREEMAN, OTIS W., Glacial Features and Glacier Recession in the Upper Lake Chelan Region, Washington, 49-50, 1941
- FREEMAN, OTIS W., The Hop Industry of the Yakima Valley, Washington, 8, 1935
- FREEMAN, OTIS W., The Pacific Northwest Pea Industry, 30, 1942
- Fresno County's Agriculture Related to Soils and the Availability and Quality of Irrigation Water, by Chester F. Cole, 35-36, 1951
- Fresno, The City of, by Elizabeth Schreiber, 38-39, 1940
- FULLENWIDER, ELMER D., A Geographical Approach to the Social Studies, 30, 1936
- Gadsden Purchase, Historical Geography of the, by Joseph T. Hazard, 24, 1936
- GARRETT, DAVID A., The Sardine Industry of San Pedro, California, 40, 1951
- GARRISON, WILLIAM L., Rural Roads, 63, 1954
- GARRISON, WILLIAM L., Measuring the Significance of Primary Employment, 50, 1952
- GARRISON, WILLIAM L., The Application of the Concept of Optimum to the Size of the City, 49, 1951
- GEDDES, ARTHUR, Change and Variability of Population in the United States, 58-59, 1952
- A Geographer Looks at Politics, by George C. Kimber, 35, 1939
- Geographic Names, The Northernmost Spanish Frontier in California as Evidenced by the Distribution of, by Hallock F. Raup, 46, 1951
- Geography in America, Some Contributions of William Morris to, by Vera E. Rigdon, 36, 1937
- Geography, the Dynamic Aspects of, by Henry J. Warman, 45, 1951
- Geography in Far-Western Institutions of Higher Learning, by Otis W. Freeman, 50, 1948
- Geography in Flight, by G. Etzel Percy, 42-43, 1949
- Geography in the Secondary Schools of the Pacific Coast States, by James F. Chamberlain, 21, 1935
- Geography in the Secondary Schools of Utah, by Albert C. Antrie, 36, 1950
- Geopolitics—Some Applications and Implications, by Willis H. Miller, 31, 1942
- GERLACH, ARCH C., Areal and Annual Variations of Climatic Types in California, 50, 1941
- GIBSON, LYLE E., Land Use in the Urban-Rural Margin North of San Francisco, 40-41, 1953
- GIERHART, JOHN W., The Fertilizer Industry of the Pacific Northwest, 63, 1954
- GIERHART, JOHN W., Urban Regions as Indicated by Newspaper Circulation, 50, 1952
- Glacier Ice Movement in the Amundsen Gulf Area, Northwest Territories, by Ross J. MacKay, 64, 1954
- GLENDINNING, ROBERT M., The Simi Valley, Ventura County, California, 10, 1938
- Grasslands, Need for Research on, by Herbert C. Hanson, 27-28, 1937
- Grasslands on Sunward Slopes, Natural, by John E. Smith, 51, 1952
- GRAVES, DALE V., The Historical Geography of Olympia, Washington, 55-56, 1952
- Guatemala, The Quirigua Region of, by Glenn Cunningham, 19, 1935
- GUEFFROY, EDNA M., The Pre-European Peoples of New Zealand, 48-49, 1948

- GVOSDETSKY, VASYL, Paleo-Pedology and the History of Lake Bonneville, 54-55, 1952
- GVOSDETSKY, VASYL, Special Artificial Pits and Soils Methods in Studying the Quaternary Deposits in the Ukraine, 37, 1950
- HAMBURG, ERNESTINE, Geography of Pend Oreille County, Washington, 43, 1940
- HAMILTON, LEDA, Factors in the Growth of Everett, Washington, 37-38, 1940
- HANSEN, GEORGE H., Influence of Geography on Population Trends in Utah, 27, 1942
- HANSEN, L. T., The Importance of the Pacific Basin in Continental Displacement, 44-45, 1947
- HANSON, HERBERT C., Need for Research on Grasslands, 27-28, 1937
- HARTLEY, ROBERT A., Sequent Occupance in the Roseburg District, 53, 1952
- Havasü Canyon and the Havasupai Indians, by J. W. Hoover, 49, 1941
- Hawaii, Changing Scenes in, by Otis W. Freeman, 37, 1949
- HAWKES, H. BOWMAN, Utah's Turkey Enterprise, Geography of, 36-37, 1950
- HAWKES, H. BOWMAN, Theory of Mountain and Valley Winds, 45, 1948
- HAZARD, JOSEPH T., Historical Geography of the Gadsden Purchase, 24, 1936
- HAZARD, JOSEPH T., The Influence of the Canadian Selkirks on the Western Movement, 40-41, 1940
- Heat Inventory for Agricultural Purposes, by Robert W. Pease, 42, 1940
- HENDERSON, DAVID A., Corn Belt Cattle Feeding in Colorado's Irrigated Oases, 41, 1953
- HERMAN, THEODORE, The Background of Modern Chinese Nationalism, 58, 1952
- HIGHSMITH, RICHARD M., JR., Irrigation Agricultural Specialties in the Yakima Valley, 35-36, 1947
- HOOVER, J. W., Cerros de Trincheras in the Papago Country of Arizona, 34-35, 1939
- HOOVER, J. W., Development and Sites of the Papago Villages of Arizona and Sonora, 23, 1935
- HOOVER, J. W., Havasu Canyon and the Havasupai Indians, 49, 1941
- HOOVER, J. W., The Papago Villages of Arizona and Sonora: Types and Sites, 28-29, 1938
- Hop Production of the Pacific Coast States, The, by Elbert E. Miller, 43, 1949
- Hop Industry of the Yakima Valley, Washington, The, by Otis W. Freeman, 8, 1935
- Human Energy, Physical and Emotional, Under Varying Weather Conditions, by Lucile Carlson, 39-40, 1948
- Humboldt County, California, The Geography of, by Willis B. Merriam, 42-43, 1953
- Indian Fishing Rights in Washington and Their Effect on Salmon Conservation, by Tim K. Kelley, 34-35, 1947
- Indigo Industry of South Carolina, The Rise and Decline of the, by Walter W. Ristow, 32, 1936
- Iron Ore Resources of China, by Wilma Belden, 28, 1935
- Japan, The Earthquake: An Agricultural Hazard in, by Frances M. Earle, 45-46, 1947
- Japan, The Intensification of Agriculture in Sub-Tropical, by Margaret Carstairs, 37, 1939

- Java, Geographic Regions of, by Willert Rhynsbarger, 32, 1947
- Java, Re-Settlement Programs to Relieve Population Pressure in, by Anthony Sas, 38-39, 1951
- JENSEN, J. GRANVILLE, Regional Basis for Population Increase of the Corvallis-Albany Urban Center, 42, 1947
- JOHNSTON, PHILIP M., Vocabulary of High School Physical Geography, 35, 1937
- JONES, EDWARD J., JR., Oregon's Climate, A Rational Classification, 53-54, 1952
- Junior Colleges, Geography in the, by John J. Buoncristiani, 51, 1941
- Karafuto, Geography of, by Howard H. Martin, 43, 1940
- KELLEY, TIM K., Indian Fishing Rights in Washington and Their Effect on Salmon Conservation, 34-35, 1947
- KESSELL, JOHN E., The Origin of the Valley of June, Gull, and Silver Lakes (Horseshoe Valley), Mono County, California, 33, 1939
- KESSELL, JOHN E., Rock Streams in the Sierra Nevada, California, 40, 1940
- KIMBER, GEORGE C., A Geographer Looks at Politics, 35, 1939
- KOLLMORGEN, W. M., Settlement Pattern Attitudes of High School Students, 28, 1942
- Korea, Regional Diversity in, by Shannon McCune, 49, 1948
- KOSTANICK, HUEY LOUIS, Problem Areas of the Balkans, 35-36, 1950
- KUCHLER, A. W., Chorology and Conservation, 48, 1941
- KUCHLER, A. W., Localizing Vegetation Terms, 39, 1947
- LACKEY, EARL E., Annual Variability Rainfall Maps of the Great Plains, 33, 1937
- Lake Bonneville, Paleo-Pedology and the History of, by Vasyi Gvosdetsky, 54-55, 1952
- Lake Chapala and the Possibility of Its Being the Site of Late Pleistocene Man, A Preliminary Report on the Geography of, by R. B. Peters, 48, 1951
- Land Ownership in Hawaii and Its Influence on the Local Economy, by Frances M. Earle, 32-33, 1947
- Landscapes of the San Gabriel Mountains, by Joseph E. Williams, 51, 1941
- Land Use, Geographic Aspects of, by Helen M. Strong, 36, 1939
- Land Use in the Urban-Rural Margin North of San Francisco, by Lyle E. Gibson, 40-41, 1953
- LANTIS, DAVID W., Mexico, Land of Change and Contrast, 56-57, 1952
- LANTIS, DAVID W., Successive Occupance of the Taos Valley, 47, 1951
- LAWTON, GRAHAM H., Utilization of the Brown Coal Deposits of Southeast Australia, 36-37, 1949
- LEIGHLY, JOHN, The Normal Annual March of Precipitation in California, 45-46, 1948
- LEIGHLY, JOHN, Observations Bearing on the Development of Meanders in Intermittent Streams, 25, 1935
- LEIGHLY, JOHN, The Rainiest Month in California, 41-42, 1947
- Livermore Valley, Land Utilization in the, by David Lowenthal, 43, 1948
- LOEFFLER, M. JOHN, Rocky Ford, Colorado: Cantaloupe Seed Center, 35, 1949
- LOGAN, RICHARD F., The Cuyama: Land of Dramatic Change, 45, 1951
- Los Angeles Freeway System, The, by Lawrence Thompson, 36, 1951
- Los Angeles, The Site of Early, by Ruth E. Baugh, 50-51, 1941



- LOWENTHAL, DAVID, Land Utilization in the Livermore Valley, 43, 1948
- MACKAY, ROSS J., Glacier Ice Movement in the Amundsen Gulf Area, Northwest Territories, 64, 1954
- MACPHAIL, DONALD D., Land Tenure Problems in Southern Puerto Rico, 41-42, 1953
- MACPHAIL, DONALD D., Pastoral Land Use Changes in Southern Puerto Rico, 64, 1954
- Marjorca, by Joseph E. Williams, 20-21, 1935
- Mapping Land Utilization, A Cooperative Method of, by F. G. Dale, 32-33, 1937
- MARCH, NORMAN T., The Livelihood Structure of Salem, Oregon, 49, 1952
- MARTIN, HOWARD H., Denver: An Urban Analysis, 33, 1947
- MARTIN, HOWARD H., Geography of Karafuto, 43, 11940
- MARTIN, HOWARD H., Industrial Seattle, 18, 1936
- MARTIN, HOWARD, H., Reclamation in the Zuider Zee, 49, 1941
- MARTIN, HOWARD H., The Service Industries in Urban Evaluation, 64-65, 1954
- Massachusetts-Rhode Island Boundary as an Example of a State Line's Influence on the Occupance Pattern of an Area, The, by Edward Ullman, 31-32, 1936
- MATHESON, MARION H., The Influence of the Hinterland Upon the Urban Pattern of Nanaimo, British Columbia, 34-35, 1949
- McCUNE, SHANNON, Regional Diversity in Korea, 49, 1948
- McINTYRE, MICHAEL, Plantation Agriculture in the New Hebrides, 31, 1947
- McKEAN, GERTRUDE L., Industrial Tacoma, 38, 1940
- McKIM, V. CALVON, Geographic Background of Spanish Grants, Taos County, New Mexico, 42, 1951
- Meanders in Intermittent Streams, Observations Bearing on the Development of, by John Leighly, 25, 1935
- Measuring the Significance of Primary Employment, by William L. Garrison, 50, 1952
- Medical Geography, A Study in, The Impact of Disease Upon the Hawaiian Islanders:, J. E. Spencer, and J. A. Myerson, 44, 1951
- MEIGS, PEVERIL, Maps of Current Trends in California Orchards and Vineyards, 50, 1941
- MEINING, DONALD W., Walla Walla to Liverpool: Problems in the Export of Columbia Basin Wheat, 42, 1953
- Melbourne as a Functional Center, by Clifford M. Zierer, 51-52, 1941
- MERRIAM, WILLIS B., Geonomics of the Rogue River Valley, 24-25, 1935
- MERRIAM, WILLIS B., Historical Geography of the Rogue River Valley, 41-42, 1940
- MERRIAM, WILLIS B., The Forest Situation in Western Washington, 28-29, 1936
- MERRIAM, WILLIS B., The Geography of Humboldt County, California, 42-43, 1953
- MERRIAM, WILLIS B., Some Observations on the Plow Versus the Trap in the Historical Geography of the Pacific Northwest, 38, 1949
- Metropolitan Affinities of the Middle Shenango Valley Towns, by Clyde E. Browning, 52, 1952
- Mexican Highlands of the Basin and Range Type, Recent Land Forms on the, by R. B. Peters, 53, 1952
- Mexico, Erosion Lessons to be Learned from, by W. A. Rockie, 30-31, 1942

- Mexico, Land of Change and Contrast, by David W. Lantis, 56-57, 1952
- Mexico, Roads and Transport in Colonial, by Robert E. West, 48-49, 1941
- Midway Islands, by Estelle Rankin, 31-32, 1947
- MIKESELL, MARVIN W., The Changing Role of the Port of Santa Barbara, 43, 1953
- MILLER, DAVID H., A Terrain Sample of the Sierra Crest Region, 46-47, 1948
- MILLER, ENID L., Production Trends in the Northwest Fisheries, 22, 1936
- MILLER, ELBERT E., The Cache Valley, Dairyland of Utah, 55, 1952
- MILLER, ELBERT E., The Hop Production of the Pacific Coast States, 43, 1949
- MILLER, WILLIS H., The California Mapping Plan, 52-53, 1941
- MILLER, WILLIS H., Geography and State Planning (Summary), 2, 1939
- MILLER, WILLIS H., Geopolitics—Some Applications and Implications, 31, 1942
- Missouri River, Traffic on the, by Sidney E. Ekblaw, 44-45, 1948
- Monterey Bay, Land Forms and Land Use on the Eastern Shore of, by Charles Noble, 40-41, 1947
- Mono County, California, The Origin of the Valley of June, Gull, and Silver Lakes (Horseshoe Valley), by John E. Kesseli, 33, 1939
- NELSON, HOWARD J., Des Moines: Origin and Growth, 29-30, 1950
- NELSON, HOWARD J., Vernon, California, An Incorporated Industrial City, 39-40, 1951
- NELSON, HOWARD J., Some Thoughts on Urban Morphology, 43-44, 1953
- NEWCOMB, ROBERT W., A Phytogeographical Transect of the Southern San Francisco Peninsula, 43-44, 1951
- NEWCOMB, ROBERT W., The Place of Spice Culture in Pre-European Oriental Agriculture, 44, 1953
- New Hampshire, The Seamless Hosiery Industry of Laconia, by J. Norman Carls, 31, 1936
- New Hebrides, Plantation Agriculture in the, by Michael McIntyre, 31, 1947
- NEWHOUSE, HAZEL R., Currents of the North Pacific, 54, 1952
- New Zealand, The Dalmatian Element in the Population of, by Albert W. Smith, 42-43, 1951
- New Zealand, Phormium Tenax in the Economy of, by Keith W. Thomson, 38-39, 1949
- New Zealand, Structural and Climatic Units in the Vegetation of, by Pierre Dansereau, 37-38, 1949
- New Zealand, The Ahuriri Lagoon: A Study of an Evolving Habitat, by Bryan H. Farrell, 39, 1949
- Nigeria—A Study in Political Geography, Northern, by John B. Appleton, 22-23, 1935
- NOBLE, CHARLES, Land Forms and Land Use on the Eastern Shore of Monterey Bay, 40-41, 1947
- North Pacific, Currents of the, by Hazel R. Newhouse, 54, 1952
- North Pacific Ocean, Winter Air Mass Convergence in the, by Robert W. Richardson, 27-28, 1935
- Northwest, Towns and Cities of the, by H. F. Raup, 29, 1942
- OAKESHOTT, GORDON B., Geomorphology from Detailed Geologic Mapping, Western San Gabriel Mountains, 30-31, 1938
- Occupance and Abandonment of Tye: A Cascade Mountain Community, The, by Leonard C. Ekman, 28-29, 1937

- Olympic Peninsula Timber Town, The Evolution of an, by Margaret Carstairs, 34, 1947
- Olympia, Washington, The Historical Geography of, by Dale V. Graves, 55-56, 1952
- Pacific Islands, Geographic Obstacles to Economic Rehabilitation of the Trust Territory of the, by J. L. Taylor, 41-42, 1949
- Pacific, Naval Administration in the, by J. L. Taylor, 40, 1947
- Pacific Northwest, The Evolving Transportation Pattern of the, by Frances M. Earle, 40, 1953
- Pacific Northwest, Some Observations on "The Plow Versus the Trap" in the Historical Geography of the, by Willis B. Merriam, 38, 1949
- Palau Islands, Natural Resources of the, by Woodrow R. Clevinger, 41-42, 1948
- Palouse Wheat Area, Changes in Land Use in the Pullman-Moscow Section of the, by Harold H. Rhodes, 45, 1940
- Papago Country of Arizona, Cerros de Trincheras in the, by J. W. Hoover, 34-35, 1939
- Papago Country of Arizona and Sonora, Development and Sites of the, by J. W. Hoover, 23, 1935
- Papago Villages of Arizona and Sonora: Types and Sites, The, by J. W. Hoover, 28-29, 1938
- Papago Development Program, An Example of Land Use Planning, The, by Andrew W. Wilson, 47, 1951
- PARSONS, JAMES J., Antioqueno Colonization in Northwestern Colombia, 44, 1947
- PARSONS, JAMES J., Industrial Development of the San Francisco Bay Area, 48, 1948
- PATTON, CLYDE P., The New Thornthwaite Classification as Applied to the Climates of California, 33-34, 1950
- Pea Industry, The Pacific Northwest, by Otis W. Freeman, 30, 1942
- PEARCY, G. ETZEL, Air Transportation in the Far East, 49-50, 1948
- PEARCY, G. ETZEL, Geography in Flight, 42-43, 1949
- PEASE, ROBERT W., Heat Inventory for Agricultural Purposes, 42, 1940
- PEASE, ROBERT W., Problems of Recreational Use of Lake Elsinore, California, 43, 1947
- Pend Oreille County, Washington, Geography of, by Ernestine Hamburg, 43, 1940
- PENCE, W. ROSS, The White River Valley of Washington, 45-46, 1940
- PEPKE, HOWARD, Agro-geographic Adjustments in the Wenatchee Valley, 43-44, 1940
- PETERS, R. B., A Preliminary Report on the Geography of Lake Chapala and the Possibility of Its Being the Site of Late Pleistocene Man, 48, 1951
- PETERS, R. B., Recent Land Forms on the Mexican Highlands of the Basin and Range Type, 53, 1952
- Petroleum Industry of the Los Angeles Lowlands, The, by John C. Albright, Jr., 38, 1953
- Phosphate Rock Industry of the Pacific, The, by Anthony Sas, 56, 1952
- Physiographic Expression of the Indian Creek Plutons of the Denver Mountain Parks Region, Colorado, The, by Margaret Fuller Boos, 30-31, 1937
- Physiographic Mapping with Aerial Photographs, Cottonwood Creek, Washington, by Francis J. Schadeegg, 28-29, 1950
- Physiography of Western Washington, The, by Howard A. Coombs, 20, 1936

- Photographic Interpretation of Arctic Alaska, A, by Woodrow R. Clevinger, 51-52, 1952
- Phytogeographical Transect of the Southern San Francisco Peninsula, A, by Robert W. Newcomb, 43-44, 1951
- Political Divisions of Idaho, by Benjamin E. Thomas, 34, 1950
- Population Changes in the Coast Ranges of Northern California, Notes on, by J. C. Broek, 38, 1939
- Population in the United States, Change and Variability of, by Arthur Geddes, 58-59, 1952
- Population Trends in Utah, Influence of Geography on, by George H. Hanson, 27, 1942
- Port Arthur-Fort Williams, The Canadian Lakehead, by Stanley A. Arbingast, 33, 1949
- POST, LAUREN C., Revolution in the Beef Cattle Industry in the Southern United States, 44-45, 1953
- Precipitation, A Modification of the Köppen Criteria for Determining Seasonal Distribution of, by Anna Marie Boschen, 26, 1935
- Portland, Oregon, Studies in the Urban Geography of, by Norman Carls, 37, 1940
- Precipitation in California, The Normal Annual March of, by John Leighly, 45-46, 1948
- Propaganda, The Use of Maps in, by Louis O. Quam, 30, 1942
- Puerto Rico, Land Tenure Problems in Southern, by Donald D. MacPhail, 41-42, 1953
- Puerto Rico, Pastoral Land Use Changes in Southern, by Donald D. MacPhail, 64, 1954
- QUAM, LOUIS O., The Use of Maps in Propaganda, 30, 1942
- Quaternary Deposits in the Ukraine, Special Artificial Pits and Soils Methods in Studying the, by Vasyly Gvosdetsky, 37, 1950
- Rainfall Maps of the Great Plains, Annual Variability, by Earl E. Lackey, 33, 1937
- Rainiest Month in California, The, by John Leighly, 41-42, 1947
- RANKIN, ESTELL, Midway Islands, 31-32, 1947
- RAUP, H. F., The Northernmost Spanish Frontier in California as Evidenced by the Distribution of Geographic Names, 46, 1951
- RAUP, H. F., San Francisco, 1846-1946, 33-34, 1947
- RAUP, H. F., The Susquehanna Corridor: A Neglected Trans-Appalachian Transportation Route, 37, 1939
- RAUP, H. F., Towns and Cities of the Northwest, 29, 1942
- Razor Clam Fishery of the Washington Coast, The, by Clarke H. Brooke, Jr., 50-51, 1952
- Recreational Land Use in the North Idaho Lake District, by Harry R. Caldwell, 39, 1953
- Recreational Resources of the Pacific Northwest, Scenic, and, by Margaret Thompson, 46-47, 1940
- Recreational Use of Lake Elsinore, California, Problems of, by Robert W. Pease, 43, 1947
- REITH, JOHN W., and REITH, GERTRUDE M., Causes of Coal Mining Decline in the Danville District, Illinois, 45, 1953
- Resorts of the Orient, The Hill Stations and Summer, by W. L. Thomas, 43-44, 1947
- RHODES, HAROLD H., Changes in Land Use in the Pullman-Moscow Section of the Palouse Wheat Area, 45, 1940

- Rhodesia, The "Chitemene" System of Northeastern, by N.F.C. Davis, 42-43, 1940
- RHYNBURGER, WILLERT, Geographic Regions of Java, 32, 1947
- RHYNBURGER, WILLERT, Patterns of Highway Transportation in the European USSR, 57, 1952
- Rice as a Crop Plant, An Inquiry in the Nature of, by Joseph E. Spencer and Robert W. Pease, 66, 1954
- RICHARDSON, ROBERT W., Winter Air Mass Convergence in the North Pacific Ocean, 27-28, 1935
- RIGDON, VERA E., Some Contributions of William Morris Davis to Geography in America, 36, 1937
- Rio Verde Valley, The Geographic Setting of the Middle, by Agnes M. Allen, 31-32, 1938
- RISTOW, WALTER W., The Rise and Decline of the Indigo Industry of South Carolina, 32, 1936
- ROBINSON, J. LEWIS, Agricultural Regions of British Columbia, 45-46, 1953
- Rock Streams in the Sierra Nevada, California, by John E. Kesseli, 40, 1940
- ROCKIE, W. A., Erosion Lessons to Be Learned from Mexico, 30-31, 1942
- ROCKIE, W. A., Snowdrift Conditions in the Palouse, Eastern Washington, 41, 1949
- Rocky Ford, Colorado: Cantaloupe Seed Center, by M. John Loeffler, 35, 1949
- Rogue River Valley, Geonomics of the, by Willis B. Merriam, 24-25, 1935
- Rogue River Valley, Historical Geography of the, by Willis B. Merriam, 41-42, 1940
- Rogue River Valley, Oregon, Urban Rivals of the Middle, by William A. Erwin, Jr., 57-58, 1952
- Roseburg District, Sequent Occupance in the, by Robert A. Hartley, 53, 1952
- Rural Roads, by William L. Garrison, 63, 1954
- Rubber Terrain Models (Navy Training Film), by Woodrow R. Clevinger, 47, 1948
- RYBERG, VIOLET, Agriculture in Tucuman, Argentina, 36-37, 1947
- Saipan, Land Utilization on, J. L. Taylor, 42, 1948
- Salem, Oregon, The Livelihood Structure of, by Norman T. March, 49, 1952
- SALTER, RICHARD G., The Historical Geography of Tooele, 1847-1870, 54, 1952
- San Andreas Fault Zone in Southern California, The Leonis Valley-Elizabeth Lake Area, A Part of the, by June Carroll, 41, 1947
- San Francisco Bay Area, Industrial Development of the, by James J. Parsons, 48, 1948
- San Francisco, 1846-1946, by H. F. Raup, 33-34, 1947
- San Francisco Bay Area, The Greenhouse Flower Industry of the, by Donald I. Eidemiller, 45, 1947
- San Gabriel Mountains, Geomorphology from Detailed Geologic Mapping, Western, by Gordon B. Oakeshott, 30-31, 1938
- Santa Barbara, The Changing Role of the Port of, by Marvin W. Mikesell, 43, 1953
- Santa Clara Valley, Land Utilization in the Northern, by Edward N. Torbert, 18, 1935
- Sardine Industry of San Pedro, California, The, by David A. Garret, 40, 1951
- SAS, ANTHONY, The Iron and Steel Industry in Vancouver, 65-66, 1954



- SAS, ANTHONY, The Phosphate Rock Industry of the Pacific, 56, 1952
- SAS, ANTHONY, Re-Settlement Programs to Relieve Population Pressure in Java, 38-39, 1948
- SAS, ANTHONY, Zuid-Limburg: The Highlands of Holland, 40, 1949
- SCHADEGG, FRANCIS J., Land-Use Planning and the Colville Valley, Washington, 42-43, 1948
- SCHADEGG, FRANCIS J., Physiographic Mapping with Aerial Photographs, Cottonwood Creek, Washington, 28-29, 1950
- Schools and Colleges, Soil Conservation Instruction in Common, by J. Wright Baylor, 29-30, 1938
- School Geographers, The Need for a Harmonious and Aggressive Front on the Part of, by H. W. Fairbanks, 30, 1935
- SCHNEIDER, HYRUM, Geologic Factors in the Settlement and Development of Utah, 27-28, 1942
- SCHREIBER, ELIZABETH, The City of Fresno, 38-39, 1940
- Seattle, Commercial, by Albert L. Seeman, 23, 1936
- Seattle, Industrial, by Howard H. Martin, 18, 1936
- SEEMAN, ALBERT L., Commercial Seattle, 23, 1936
- SEEMAN, ALBERT L., The Cranberry Industry of Western Washington, 46, 1940
- Service Industries in Urban Evaluation, The, by Howard H. Martin, 64-65, 1954
- Settlement and Development of Utah, Geologic Factors in the, by Hyrum Schneider, 27-28, 1942
- Settlement Pattern Attitudes of High School Students, by W. M. Kollmorgen, 28, 1942
- SHAW, R. M., The Range Sheep Industry of Kittitas County, 44, 1940
- Sheep Industry of Kittitas County, The Range, by R. M. Shaw, 44, 1940
- Sierra Crest Region, A Terrain Sample of the, by David H. Miller, 46-47, 1948
- Houses in the Chaco Canyon Region, New Mexico, Sites of Prehistoric Community, by Malcolm Bissell, 48, 1941
- Small Area Studies Illustrated by Oregon's McKenzie Valley, Notes on, by Samuel N. Dicken, 39, 1951
- SMITH, ALBERT W., The Dalmatian Element in the Population of New Zealand, 42-43, 1951
- SMITH, JOHN E., Natural Grasslands on Sunward Slopes, 51, 1952
- SMITH, WARREN D., A Commonwealth of Nations: A Geographer's Solution, 31-32, 1942
- SMITH, WARREN D., The Geography of Eugene, 48, 1948
- Snowdrift Conditions in the Palouse, Eastern Washington, by W. A. Rockie, 41, 1949
- Social Studies, A Geographical Approach to the, by Elmer D. Fullenwider, 30, 1936
- Soil Erosion as a Geographic Determinant in the Northwest, by J. Eright Baylor, 26-27, 1936
- SOUTH, DON, The Growth and Distribution of Population of Vancouver, British Columbia, 34, 1949
- Southern United States, Revolution in the Beef Cattle Industry in the, by Lauren C. Post, 44-45, 1953
- SPENCER, J. E., The Houses of Southern Utah, 28, 1942

- SPENCER, J. E., and MYERSON, J. A., The Impact of Disease upon the Hawaiian Islanders: A Study in Medical Geography, 44, 1951
- SPENCER, JOSEPH E., and PEASE, ROBERT W., An Inquiry into the Nature of Rice as a Crop Plant, 66, 1954
- SPENCER, JOSEPH E., Renewed Expansion Along an Old Chinese Colonial Frontier, 52, 1941
- SPENCER, J. E., and J. E. WILLIAMS, "Symposium" arranged by the above, 53, 1941 (Agricultural and Settlement Landscapes of the Occident and Orient)
- SPENCER, J. E., The Use of Terracing in Philippine Agriculture, 31, 1950
- Spice Culture in Pre-European Oriental Agriculture, The Place of, by Robert M. Newcomb, 44, 1953
- Sponge Industry of the Caribbean Area, The, by George S. Corfield, 34, 1937
- STAMP, DUDLEY L., The New Role of Geographers in Britain, 40, 1949
- State Parks, The Geography of; a Comparison Between Indiana and Washington, by Otis W. Freeman, 36, 1947
- State Planning (Summary), Geography and, by Willis H. Miller, 2, 1939
- STEPHENS, T. EDWARD, Temperatures in the State of Washington as Influenced by the Westward Spread of Polar Air Over the Rocky and Cascade Mountain Barriers, 37, 1947
- STRONG, CHARLES F., The Geographical Significance of the Wheeler Surveys, 1869-1879, 31, 1950
- STRONG, HELEN M., Geographic Aspects of Land Use, 36, 1939
- Sugar Beet Growing in Ada and Cayon Counties, Idaho, by Kenneth J. Williams, 36-37, 1951
- Susquehanna Corridor: A Neglected Trans-Appalachian Transportation Route, by H. F. Raup, 37, 1939
- Tacoma, Industrial, by Gertrude L. McKean, 38, 1940
- Taos County, New Mexico, Geographic Background of Spanish Grants, by V. Calvon McKim, 42, 1951
- TAYLOR, J. L., Geographic Obstacles to Economic Rehabilitation of the Trust Territory of the Pacific Islands, 41-42, 1949
- TAYLOR, J. L., Land Utilization of Saipan, 42, 1948
- TAYLOR, J. L., Naval Administration in the Pacific, 40, 1947
- TAYLOR, J. L., A New Administration for the Trust Territory, 45-46, 1951
- Temperature Anomaly, New Maps of, by Winnifred Varney, 27, 1936
- Temperatures in the State of Washington as Influenced by the Westward Spread of Polar Air Over the Rocky and Cascade Mountain Barriers, by T. Edward Stephens, 37, 1947
- TENNANT, HEROLD E., Tri-functional Urbanization at Grand Coulee Dam, 39, 1940
- Terraces in the Vicinity of Fort Ross, Sonoma County, California, Marine, by Francis H. Bauer, 32-33, 1950
- Terraces in the Capitola-Watsonville Area, California, Marine and Stream, by Charles S. Alexander, 32, 1950
- Terraces of the Southeast Coastal Plain of the Dominican Republic, Marine and Streams, by W. J. Barrett, 62, 1954
- Terracing in Philippine Agriculture, The Use of, by J. E. Spencer, 31, 1950
- THOMAS, BENJAMIN, Constantine, Algeria: Fortress and Trade Center, 46, 1953
- THOMAS, BENJAMIN E., Political Divisions of Idaho, 34, 1950

- THOMAS, W. L., The Hill Stations and Summer Resorts of the Orient, 43-44, 1947
- THOMSON, KEITH W., Phormium Tenax in the Economy of New Zealand, 38-39, 1949
- THOMPSON, JOHN H., The Environmental Factor of High Altitude at Climax, Colorado, 37-38, 1947
- THOMPSON, LAWRENCE, The Los Angeles Freeway System, 36, 1951
- THOMPSON, MARGARET, Scenic and Recreational Resources of the Pacific Northwest, 46-47, 1940
- TOBERT, EDWARD N., Land Utilization in the Northern Santa Clara Valley, 18, 1935
- Tooele, 1847-1870, The Historical Geography of, by Richard C. Salter, 54, 1952
- Tourism, A Study in Comparative, Blaine and Fremont Counties, Idaho, by Harry H. Caldwell, 36, 1950
- TOWER, J. ALLEN, The Cut-Over Land Situation in Western Washington, 29, 1936
- Transportation in the European USSR, Patterns of Highway, by Willert Rhysburger, 57, 1952
- Trust Territory, A New Administration for the, by J. L. Taylor, 45-46, 1951
- Tucuman, Argentina, Agriculture in, by Violet Ryberg, 36-37, 1947
- ULLMAN, EDWARD, The Massachusetts-Rhode Island Boundary as an Example of a State Line's Influence on the Occupance Pattern of an Area, 31-32, 1936
- Urban Morphology, Some Thoughts on, by Howard J. Nelson, 43-44, 1953
- Urban Pattern of Denver, Colorado, The, by Margaret Fuller Boos and Herbert E. Winchester, 33, 1937
- Urban Regions as Indicated by Newspaper Circulation, by John W. Gierhart, 50, 1952
- Urbanization at Grand Coulee Dam, Tri-functional, by Harold E. Tennant, 39, 1940
- Utah, The Houses of Souther, by J. E. Spencer, 28, 1942
- Utah's Turkey Enterprise, Geography of, by H. Bowman Hawkes, 36-37, 1950
- Vancouver, The Iron and Steel Industry in, by Anthony Sas, 65-66, 1954
- VARNEY, WINNIFRED, New Maps of Temperature Anomaly, 27, 1936
- Vashon Island, A Study of, by Chester F. Cole, 45, 1940
- Vegetation Terms, Localizing, by A. W. Kuchler, 39, 1947
- WARMAN, HENRY J., The Dynamic Aspects of Geography, 45, 1951
- Water Resources in the Antelope Valley, California, Adjustments to Declining, by Ruth E. Baugh, 40-41, 1951
- Wenatchee Valley, Agro-geographic Adjustments in the, by Howard Pepke, 43-44, 1940
- WEST, ROBERT E., Roads and Transport in Colonial Mexico, 48-49, 1941
- Western Washington, The Cut-Over Land Situation in, by J. Allen Tower, 29, 1936
- Westward Movement, The Influence of the Canadian Selkirks on the, by Josephy T. Hazard, 40-41, 1940
- What Is the Warmest 'Month?', by Malcolm H. Bissell, 29, 1935
- Wheat, Problems in the Export of Columbia Basin, Walla Walla to Liverpool, by Donald W. Meining, 42, 1953
- Wheeler Surveys, 1869-1879, The Geographical Significance of the, by Charles F. Strong, 31, 1950

- WHITE, LANGDON, *Altitude: Its Role in the Geography of Man in the High Peruvian Sierra*, 37-38, 1951
- White River Valley of Washington, The, by W. Ross Pence, 45-46, 1940
- WHITE, W. T., *Development and Possibilities of an Alaskan Livestock Industry*, 39-40, 1940
- WHITLEY, EDWARD C., *Sequent Land Use of Bridgeport Bar, Washington*, 29, 1950
- WILLIAMS, JOSEPH E., *Landscapes of the San Gabriel Mountains*, 51, 1941
- WILLIAMS, JOSEPH E., *Marjorca*, 20-21, 1935
- WILLIAMS, KENNETH J., *Sugar Beet Growing in Ada and Canyon Counties, Idaho*, 36-37, 1951
- WILSON, ANDREW W., *Geographical Influences Affecting the Success of Agricultural Marketing Cooperatives*, 40, 1947
- WILSON, ANDREW W., *The Papago Development Program, An Example of Land Use Planning*, 47, 1951
- Wind Over San Juan Island, Washington, The Structure of Summer, by Carol C. Beamer, 31, 1937
- Wind, The Alaskan Taku, by Carol C. Beamer, 38, 1947
- Wind, Theory of Mountain and Valley, by H. Bowman Hawkes, 45, 1948
- WOODRUFF, BARBARA, *Coal Resources of China*, 13, 1935
- Yakima Valley, *Irrigation Agricultural Specialties in the*, by Richard M. Highsmith, Jr., 35-36, 1947
- YOUNG, ROBERT N., *The Function of Water Transportation in the Alaska Salmon-Canning Industry*, 35, 1947
- ZIERER, CLIFFORD M., *Melbourne as a Functional Center*, 51-52, 1941
- Zuid-Limburg: *The Highlands of Holland*, by Anthony Sas, 40, 1949
- Zuider Zee, *Reclamation in the*, by Howard H. Martin, 49, 1941







